San José-Santa Clara
Regional Wastewater Facility

2016
Annual Self-Monitoring Report

Reporting Period:
January 1 – December 31, 2016

San José-Santa Clara Regional Wastewater Facility
2016 Annual Self-Monitoring Report

San José-Santa Clara Regional Wastewater Facility Annual Reports are posted on the City of San Jose website at: http://www.sanjoseca.gov/Archive.aspx?AMID=161&Type=&ADID=

San José-Santa Clara Regional Wastewater Facility

This annual report summarizes the past year of facility effluent monitoring. Graphical tables also show flow and pollutant data back to January 2003 when data began to be stored in the current Laboratory Information Management System (LIMS). Subsequent sections of this report summarize significant or interesting events impacting facility operations, maintenance, personnel, and finance. The final section discusses ongoing receiving water monitoring and special projects.

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On the Cover: A rainbow over the wastewater facility. Photo taken by Robert Smith, Operator Grade II, on 29 October 2016.

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1. ANNUAL SELF MONITORING REPORT

The Annual Self-Monitoring Report for the San José-Santa Clara Regional Wastewater Facility is required by NPDES Permit Number CA-0037842, Water Board Order Number R2-2014-0034.

- **In 2016, the Facility maintained 100% compliance with all NPDES effluent limitations.**
- **On 20 July 2016, the Facility suffered an unfortunate seven-minute release of partially treated wastewater to the outfall channel that resulted in no exceedances of effluent limitations. The incident is explained in detail on page 32.**
- **The Facility continues to meet NPDES permit provision E-VI (permit page E-8) by participating in the San Francisco Bay Regional Monitoring Program (RMP) in collaboration with the other BACWA agencies.**

Annual status reports for various NPDES related programs and plans are summarized below:

1. General Annual Reporting for the NPDES Permit:

Permit Provisions VI.C.2 - 5 require that the facility provide the following routine status reports:

a. Effluent Characterization Study – this analytical monitoring is reported via monthly & annual Facility Self-Monitoring Reports (SMRs)

b. Pollutant Minimization Program – annual Pollution Prevention (P2) program is reported to Regional Water Board by 28 February each year & posted on City of San Jose website.

c. Pretreatment Program – annual & semi-annual pretreatment reports, submitted to Water Board by 28 February and 31 July respectively, are governed by NPDES Permit Attachment H, "Requirements for Pretreatment Annual Reports."

d. Sludge and Biosolids Management – Biosolids hauled off-site are reported to EPA, Region 9, in February each year in accordance with NPDES permit & 40 CFR part 503.

e. Collection System Management – Collection systems for Cities of San Jose & Santa Clara are managed & reported in accordance with NPDES Permit Attachment D & State Water Board Order No. WQ 2006-0003 DWQ, "General Collection System WDRs."

f. Avian Botulism Control Program – Provision VI.C.5.a: An Avian Botulism Control Program annual report is required by February 28 each year.

This SMR report, satisfying items a. & d. above, along with reports b., c. & f., are posted on City of San Jose "Regulatory Reports" website: http://www.sanjoseca.gov/index.aspx?NID=815.
The Collection System Management Annual Report (item "e") is posted at this site:
http://www.sanjoseca.gov/DocumentCenter/Home/View/7

2. Additional Annual SMR Report Requirements:

Permit Attachment G, pages G-17 thru G-18 require outline Facility Annual SMR reporting. In addition, Attachment G calls for the following plans and reports be updated annually:

a. **Contingency Plan for Operations Under Emergency Conditions**
b. **Wastewater Facilities Status Report**
c. **O&M Manual**

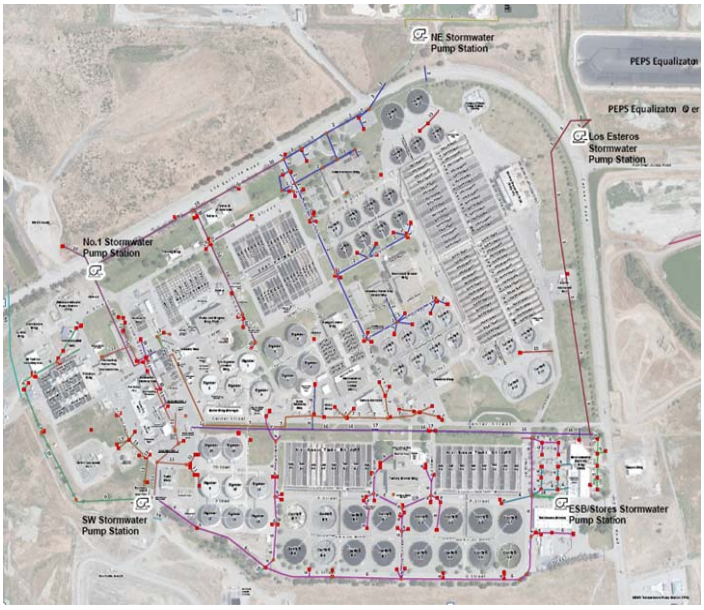
Facility Map

Water Pollution Control Plant: flow routing and influent and effluent sampling stations.

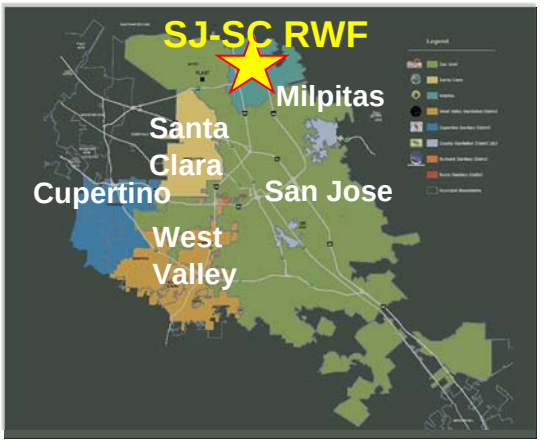
The wastewater treatment process consists of screening, grit removal, primary sedimentation, secondary (biological nutrient removal) treatment, secondary clarification, filtration, disinfection, and dechlorination.

Facility Storm Water Conveyance System

The treatment facility is designed to capture all spills and stormwater on site. 20 stormwater collection systems convey flows to 6 pump stations. Stormwater pump stations direct all captured water back to facility headworks for treatment. The stormwater catch basin system has capacity to contain at least several hundred thousand gallons of spilled process waters if such an event occurs.



Facility Service Area. The Facility receives wastewater from roughly 1.4 million residents and more than 17,000 commercial and industrial facilities. The City of San Jose manages the San José -Santa Clara Regional Wastewater Facility for the following Cities or agencies:



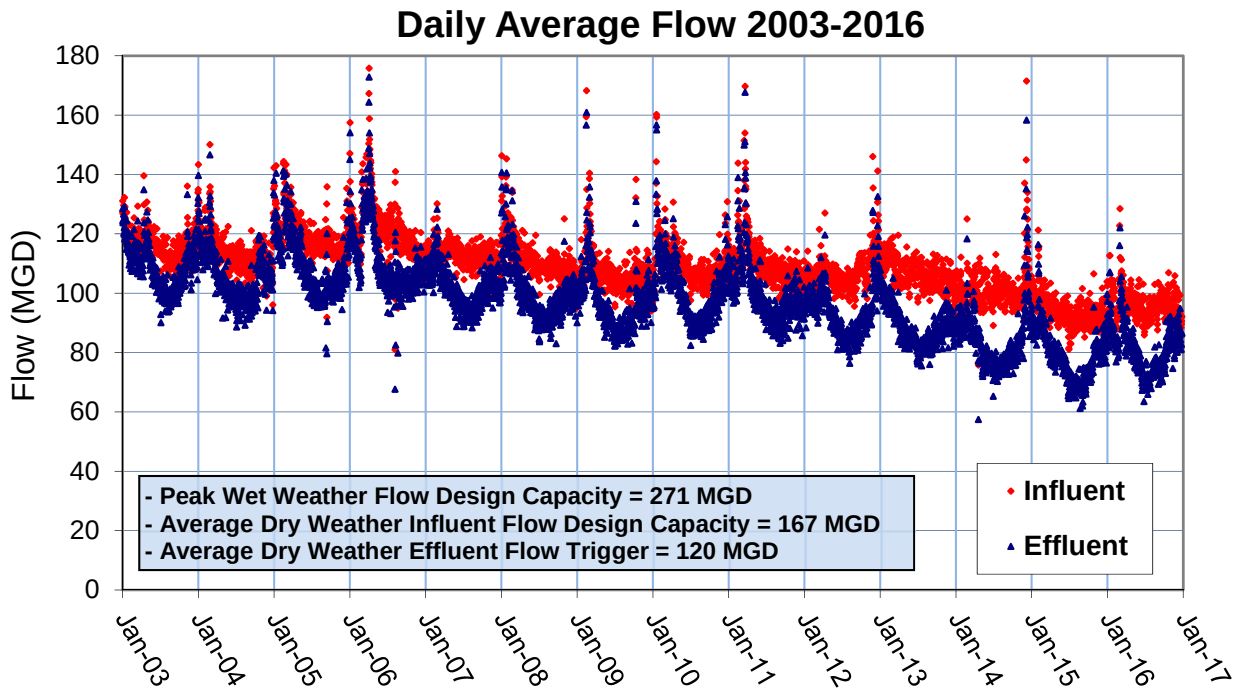
- San José,
- Santa Clara,
- Milpitas,
- Cupertino Sanitary District,
- County Sanitation Districts 2-3,
- Burbank Sanitary District, and
- West Valley Sanitation District (Campbell, Los Gatos, Monte Sereno, and Saratoga)

a. Facility Flows

The peak average monthly effluent flow of 93.8 MGD occurred in March 2016. The peak daily flow for the year was 122.1 MGD on March 7th.

- ***Average Dry Weather Influent Flow (ADWIF)*** *is the highest five-weekday period from June through October. The 2016 ADWIF was 101.1 MGD and occurred between 24 October and 28 October.*
- ***Average Dry Weather Effluent Flow (ADWEF)*** *is the lowest average Effluent flow for any three consecutive months between the months of May and October. For 2016, ADWEF was 73.0 MGD and occurred during the months of July to September.*

	Influent Flow	Effluent Flow (MGD) (Recent Years)			ADWIF Limit = 167 MGD ADWEF Trigger = 120 MGD	
	Average	Low	High	Average	ADWIF	ADWEF
2014	101.7	57.5	158.4	84.0	108.0	76.0
2015	94.1	61.2	116.4	78.7	96.2	68.9
2016	96.1	63.5	122.1	**81.4**	**101.1**	**73.0**



b. Biosolids and material

Dried Biosolid material is trucked to adjacent Newby Island Landfill where biosolids are used as Alternate Daily Cover. Disposal costs averaged $22/ ton in 2016. This coupled with the inexpensive and efficient use of drying beds and sludge lagoons (~5 million annual cost) keeps total cost of biosolids processing and disposal low when compared with other facilities of similar size.

Fecon and Caterpillar tractors at work in biosolids drying beds.

A new NPDES Electronic Reporting Rule was signed in September 2015 and requires that Biosolids Annual Reporting be transmitted electronically for all NPDES ID's under EPA jurisdiction. This annual report will be filed using the NPDES eReporting Tool (NeT), which is accessed via EPA's Central Data Exchange (CDX). This new system replaces paper submittal of reports to EPA Biosolid Regulatory Authorities.

Biosolids Hauled					
	Truck Loads	Wet Tons	Total Solids	Volatile Solids	Dry Metric Tons-DMT
2014	3,131	72,882	93%	26%	45,057
2015	3,532	53,405	87%	21%	50,002
2016	**2,889**	**49,115**	**83%**	**24%**	**37,353**

Grit, Grease, and Screenings. Grit and screenings are collected near the headworks facility. Grease is floating material that accumulates in primary and secondary clarifiers. These materials are partially dewatered prior to being hauled to the local landfill.

Grit, Grease, & Screenings Hauled (Tons)			
	Grit	Grease	Screenings
2014	447	501	607
2015	623	513	651
2016	**551 (62 hauls)**	**753 (88 hauls)**	**635 (64 hauls)**

Concentrations in Biosolids (mg/kg)			
	2014	2015	2016
Antimony	ND	ND	ND
Arsenic	3	6.3	7.5
Barium	395	410	420
Beryllium	ND	ND	ND
Cadmium	2.2	1.5	1.1
Chromium	94	75	97
(Cr STLC)	1.3	1.1	0.95
Cobalt	15	14	12
Copper	365	430	440
(Cu STLC)	6	ND	ND
Lead	31	31	25
Mercury	1.2	1.4	0.94
Molybdenum	8.2	7.4	11
Nickel	85	72	77
Selenium	3.1	6.8	ND
Silver	7.7	7.6	6.3
Thallium	ND	ND	ND
Vanadium	64	63	67
Zinc	570	620	660
Cyanide	2.5	ND	2.4
DRO organics	620	640	910
ORO organics	3700	2900	1600

c. Effluent Monitoring

Monitoring requirements from NPDES Permit Table 4 and monitoring frequency specified in Table E-3 of attachment E (Monitoring and Reporting Program) are summarized below:

Effluent Limitations (From NPDES permit Table 4)			
	Average Monthly Effluent Limit (AMEL)	Maximum Daily Effluent Limit (MDEL)	Frequency
$CBOD_5$ (BOD may be substituted)	10 mg/l	20 mg/l	Weekly
Total Suspended Solids (TSS)	10 mg/l	20 mg/l	Weekly
Oil and Grease	5 mg/l	10 mg/l	Quarterly
Total Ammonia, as N	3 mg/l	8 mg/l	Monthly
Copper	11 ug/l	19 ug/l	Monthly
Nickel	25 ug/l	33 ug/l	Monthly
Cyanide, Total	5.7 ug/l	13 ug/l	Monthly
Dioxin - TEQ	N/A	6.3×10^{-5} ug/l *(Interim)	2 x year
Indeno (1,2,3-cd) Pyrene	0.049 ug/l	0.098 ug/l	Quarterly
	Instantaneous Minimum	Instantaneous Max	
pH	6.5	8.5	Daily
Total Chlorine Residual	N/A	0.0 mg/l	Hourly
Turbidity	N/A	10 NTU	Daily
Dissolved Oxygen	5.0 mg/l	N/A	Daily
	30-day geometric mean		
Enterococcus Bacteria	35 CFU		5 x Week

Mercury & PCBs Watershed Permit. The effluent limits below are established in the Mercury and PCBs Watershed Permit, Permit # CA0038849, Order No. R2-2012-0096.

Effluent Limitations for Mercury & PCBs (Mercury & PCBs, Tables 5A & 5b)				
	AMEL ug/l	MDEL ug/l	Annual Mass	Frequency
Mercury	0.025	0.027	0.8 kg/yr	Monthly
PCBs	0.00039	0.00049	N/A	Quarterly

Nutrient Watershed Permit. Permit # CA0038873, Order No. R2-2014-0014, requires twice per month nutrient monitoring: Total Kjeldahl Nitrogen, Nitrate-Nitrite, Total Phosphorus, Soluble Reactive Phosphorus, Total Nitrogen (Calculated) - no limits are established.

- *Annual average calculations for water quality constituents are determined from monthly average results except for constituents measured daily or multiple times per week.*
- *Non-detected values are substituted with corresponding Method Detection Level (MDL) values. Tables and Graphs also substitute the MDL for non-detected results.*

1) Conventional Pollutants

The 2014 NPDES Permit established effluent limitations for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), BOD & TSS Percent Removal, Oil & Grease, pH, Total Chlorine Residual, Turbidity, Total Ammonia, and Enterococcus bacteria. Dissolved oxygen (DO) in the receiving water cannot fall below 5.0 mg/L due to effluent discharges. Loads for BOD, Ammonia, and TSS are calculated by multiplying each daily concentration by the corresponding daily average flow.

pH: Effluent pH ranged from 7.1 to 7.7 standard units (S.U.). Effluent Limits are 6.5 & 8.5 S.U.

Temperature: Effluent temperatures for 2016 ranged from 16.0 to 25.3^{o} C, averaging 21.5^{o} C.

Total Chlorine Residual: The Facility uses both continuous monitoring equipment and wet chemical analysis to monitor residual chlorine. In 2016, residual chlorine was not detected in final effluent at the outfall.

Enterococcus Bacteria: Facility Effluent Limit for *Enterococcus* is 35 colonies per 100 mL as a rolling 30-day geometric mean. The 30-day rolling geometric mean concentrations ranged from 1.0 to 10.4 Colony Forming Units (CFU) per 100 mL and averaged 3.2 CFU during 2016. The results were well below the 35 colonies per 100 mL limit but represent an increase compared to previous years when maximum 30-day geometric means were typically 1.0 CFU per 100 mL.

Beginning May 1, 2016, the Facility laboratory changed analytical methods for monitoring Enterococcus from membrane filtration (EPA 1600) to Enterolert (SM 9223B). The change was prompted by two confirmed mis-identifications of bacterial species while using the EPA 1600 method. The two methods were compared through side-by-side testing to validate the method change. Testing confirmed that Enterolert method results in fewer false positives and has the advantage of a 24-hour turnaround time compared to as much as a 4-day turnaround time for the older membrane filtration method.

Oil & Grease: In 2016, Oil and Grease ranged 1.5 to 2.0 and averaged 1.7 mg/l. All values were either DNQ or ND. Facility Effluent Limits are 5 mg/l (AMEL) and 10 mg/l (MDEL).

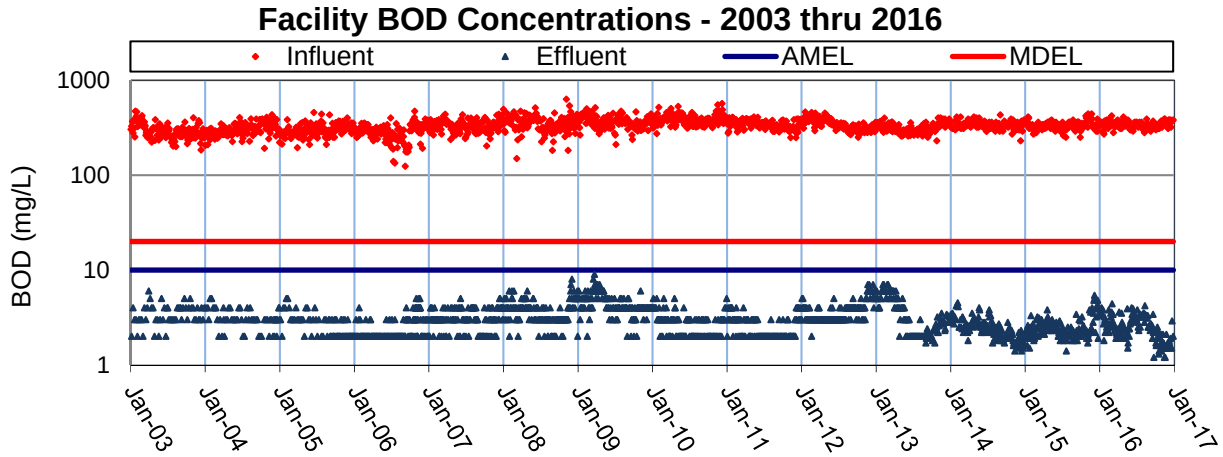
Dissolved Oxygen: Dissolved oxygen (DO) concentrations in Effluent were above the Bay Water Quality Objective of 5 mg/L throughout 2016. The 3-month rolling median value for DO percent saturation ranged from 79% to 83% in 2016.

DO Concentrations 2016				Min = 5.0 mg/L
	Low	High	Average	2015 Average
Effluent (mg/L)	6.4	7.9	7.1	7.0
Saturation (%)	73.6	89.3	80.9	79.1

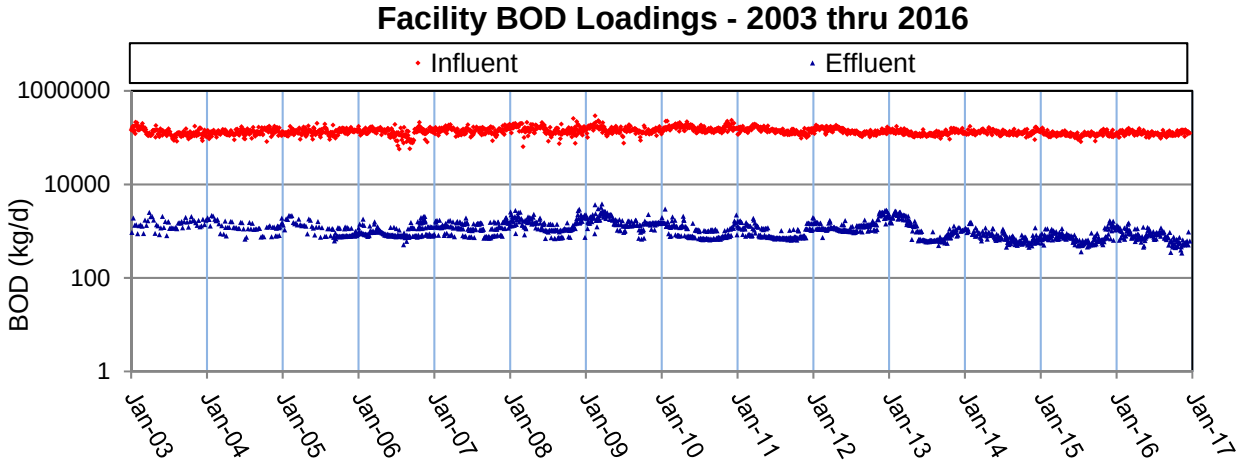
Biochemical Oxygen Demand (BOD): As defined by the American Heritage Science Dictionary, Biochemical Oxygen Demand is: "The amount of oxygen required by aerobic microorganisms to decompose the organic matter in a sample of water, such as one polluted by sewage. It is used as a measure of the degree of water pollution."

The secondary aeration process (aka: the Biological Nutrient Removal (BNR) Process) cultivates microbes that consume oxygen and organic material.

BOD (mg/L)							AMEL = 10 mg/L MDEL = 20 mg/L
	Influent			Effluent			*Removal*
	Low	High	**Average**	Low	High	**Average**	
2014	**230**	**430**	**334**	**1**	**5**	**2**	**99%**
2015	**250**	**440**	**334**	**1**	**5**	**2**	**99%**
2016	**270**	**420**	**342**	**1**	**4**	**3**	***99%***

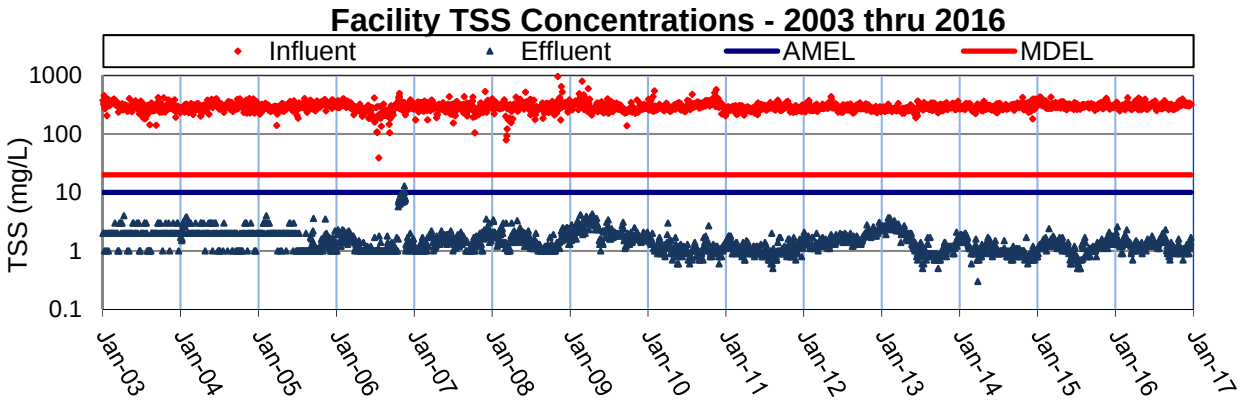


BOD Loadings 2016 (kg/d)					
	Annual Total	**Low**	**High**	**Average**	2015 Average
Influent	**45,506,566 (kg)**	**96,178**	**158,239**	**124,676**	119,418
Effluent	**286,034 (kg)**	**340**	**1496**	**784**	753

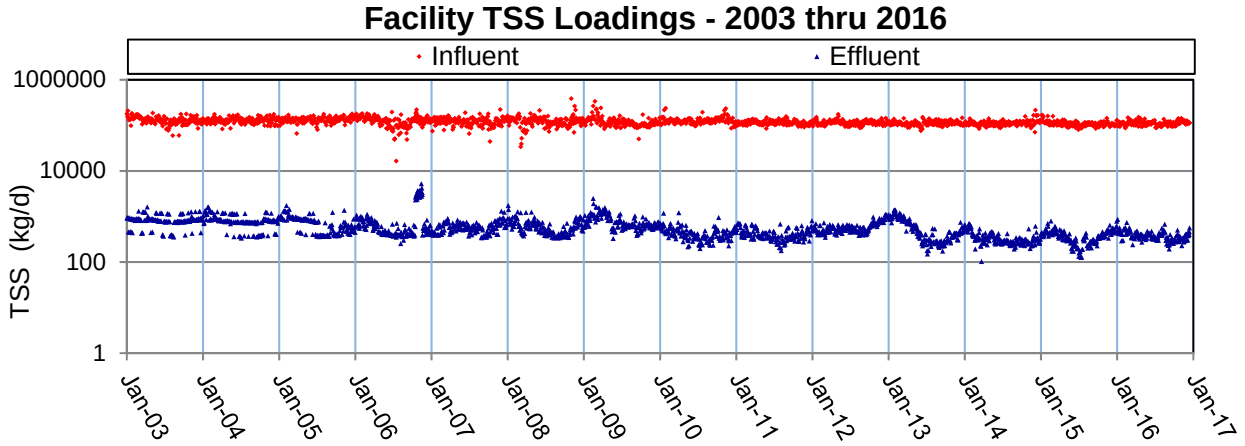


Total Suspended Solids (TSS): TSS is a measure of solid material suspended in water. Suspended solids settle out of the water column throughout the Facility treatment train: roughly half is removed in Primary settling tanks and another 40 to 45 percent is removed in Secondary/BNR clarifiers. The final 10 to 20 mg/L are removed by tertiary filtration. This was demonstrated in November 2006 during partial filtration by-pass while new filter influent pumps were installed. Effluent TSS and Turbidity increases at that time are shown in the graphs below.

TSS (mg/L)							AMEL = 10 mg/L MDEL = 20 mg/L
	Influent			Effluent			*Removal*
	Low	High	**Average**	Low	High	**Average**	
2014	**181**	**422**	**292**	**0.3**	**2.0**	**1.0**	**99.6%**
2015	**253**	**428**	**307**	**1.0**	**2.0**	**1.0**	**99.6%**
2016	**249**	**417**	**310**	**1.0**	**3.0**	**1.0**	***99.6%***

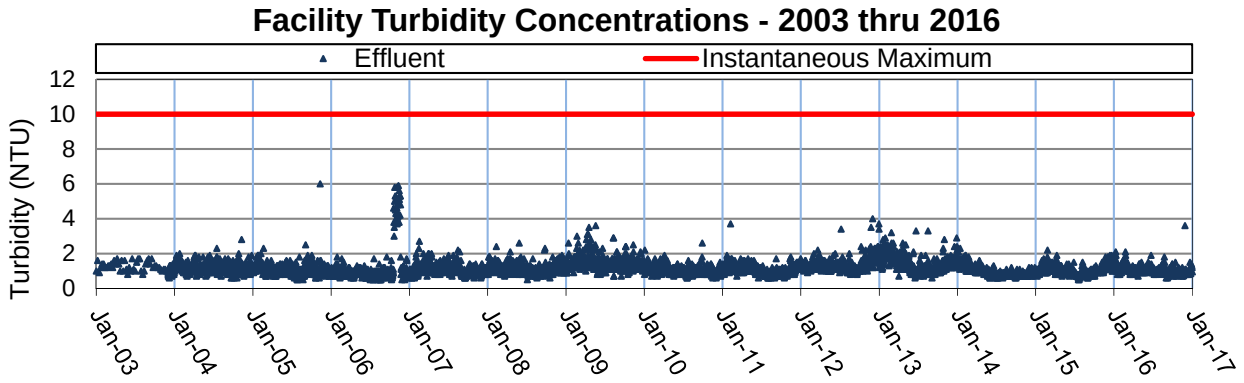


TSS Loadings 2016 (kg/d)					
	Annual Total	**Low**	**High**	**Average**	2015 Average
Influent	**41,242,959 (kg)**	**87,355**	**152,241**	**112,994**	109,938
Effluent	**143,158 (kg)**	**194**	**863**	**392**	366



Turbidity:

Turbidity 2016 (NTU)				High Limit = 10 NTU
Effluent	Low	High	Average	2015 Average
	0.6	3.6	1.1	1.1

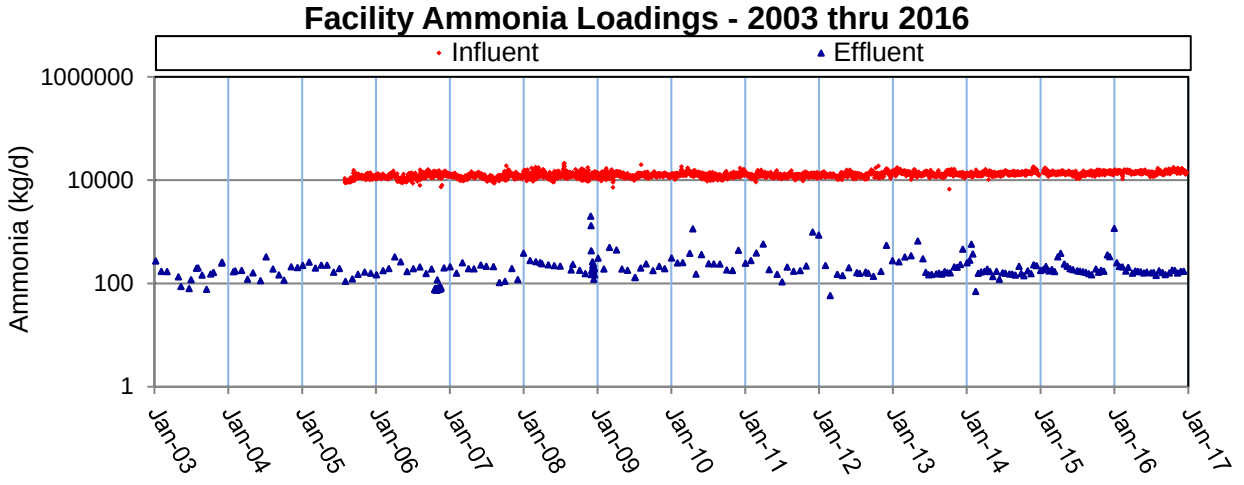


Total Ammonia: Practically all ammonia is removed. Chloramination process adds some back.

Ammonia N (mg/l)			AMEL = 3 MDEL = 8
Effluent	Low	High	Average
2014	0.2	1.7	0.6
2015	0.5	1.3	0.7
2016	**0.5**	**3.2***	**0.7**

*A single value measured on 1/6/16 was 3.2 mg/L, which is above the 3.0 mg/L AMEL. When averaged with the second monthly ammonia effluent compliance sample, the monthly average was 1.9 mg/L, which is below the AMEL.

Ammonia Loadings 2016 (kg/d)					
	Annual Total	Low	High	Average	2015 Average
Influent	5,271,000 (kg)	10,611	17,823	14,441	13,686
Effluent	79,268 (kg)	143	1168	217	210



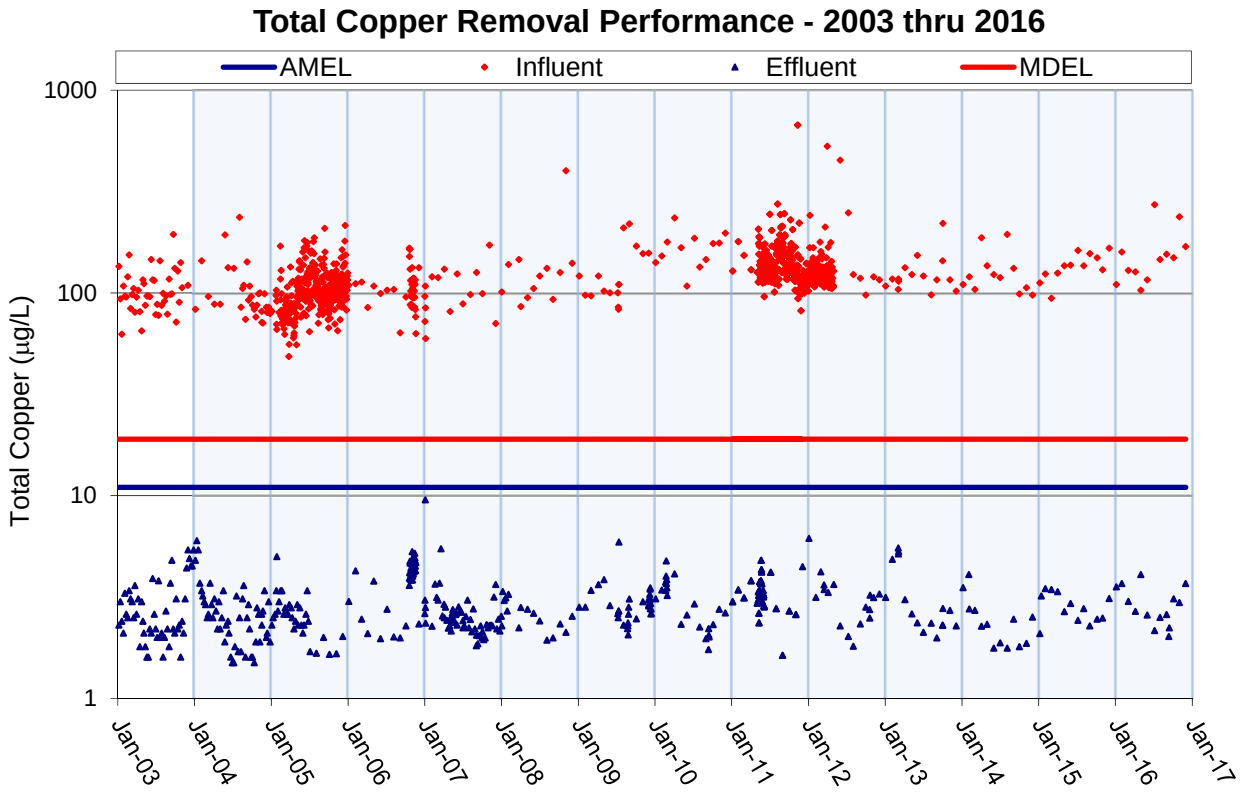
2) Priority Pollutants

The Facility is required to perform twice per year monitoring of the 126 priority pollutants listed in NPDES permit Table C of Attachment G. Most of these are organic compounds that are never detected in effluent. The Facility has specific effluent limitations for 6 priority pollutants: Copper, Nickel, Cyanide, Dioxin, Indeno (1,2,3-cd) Pyrene, and Mercury. 10 additional metals and a few organic compounds from the priority pollutant list are typically detected at concentrations below applicable Water Quality Objectives.

a) Priority Pollutants with Effluent Limitations

Copper:

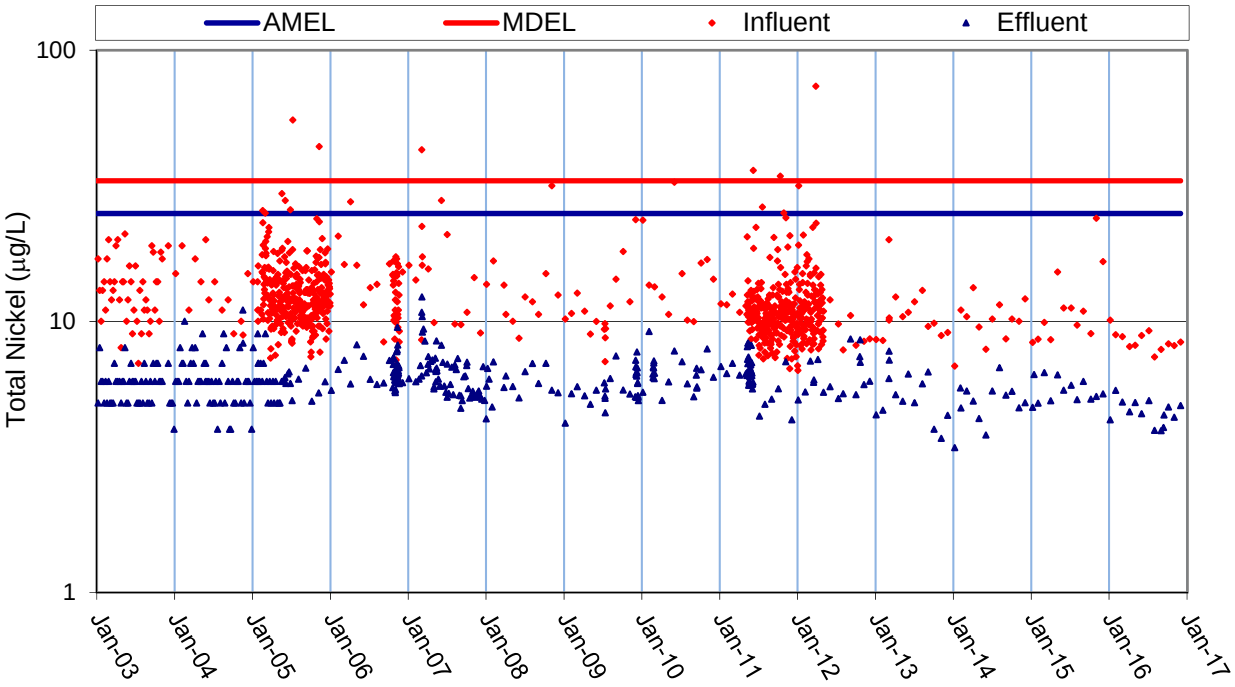
Copper (ug/L)							AMEL = 11 ug/L MDEL = 19 ug/L
	Influent			Effluent			*Removal*
	Low	High	**Average**	Low	High	**Average**	
2014	**98**	**194**	**127**	**1.77**	**4.08**	**2.36**	*98%*
2015	**94**	**166**	**136**	**2.09**	**3.48**	**2.84**	*98%*
2016	**103**	**272**	**156**	**2.02**	**4.08**	**3.03**	***98%***



Nickel:

Nickel (ug/L)							AMEL = 25 ug/L MDEL = 33 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	6.84	13.3	10.13	3.42	6.75	5.09	*50%*
2015	8.36	24.00	11.94	4.82	6.47	5.57	*53%*
2016	7.39	10.10	**8.52**	3.95	5.56	**4.71**	***45%***

Total Nickel Removal Performance - 2003 thru 2016

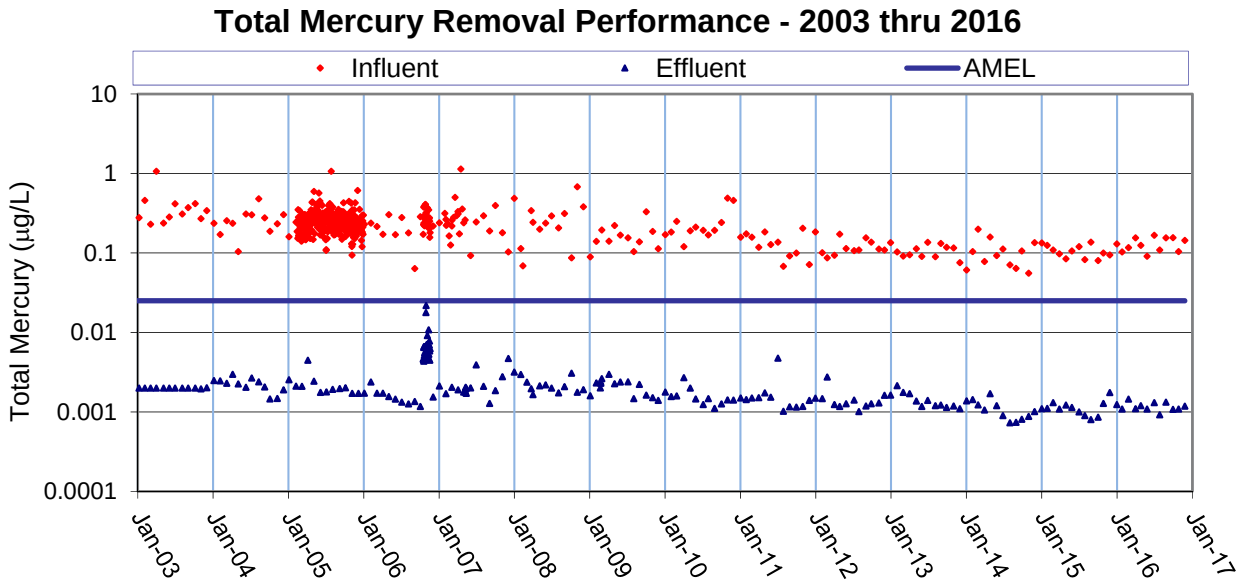


Cyanide: The Facility produces a small amount of cyanide from chloramination disinfection.

Cyanide (ug/L)							AMEL = 5.7 ug/L MDEL = 14 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	0.5 (ND)	2.2 (DNQ)	1.3	0.8 (ND)	2.6	1.9	*NA*
2015	1.2 (DNQ)	4.2	1.9	0.4 (DNQ)	1.5 (DNQ)	1.0	
2016	0.8 (ND)	2.2 (DNQ)	**1.6**	0.8 (ND)	1.2 (DNQ)	**1.0**	

Mercury:

Mercury (ug/L)						AMEL = 0.025 ug/L
	Influent			Effluent			Annual Load Kg/yr
	Low	High	Average	Low	High	Average	
2014	0.056	0.199	0.103	0.00073	0.00170	0.00100	*0.132*
2015	0.080	0.137	0.106	0.00080	0.00175	0.00113	*0.127*
2016	**0.091**	**0.167**	**0.122**	**0.00092**	**0.00145**	**0.00117**	***0.131***



Individual effluent mercury concentrations, flows, and loads in 2016

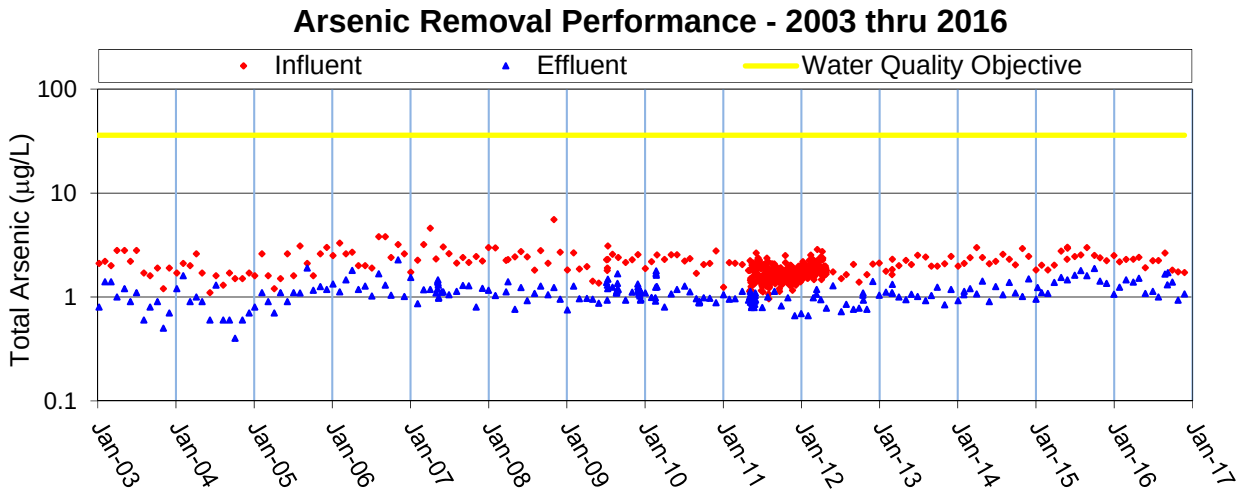
Sample Date	Mercury concentration (ug/L)	Effluent Flow (MGD)	Mercury Load (kg/day)
1/5/16	0.00124	97.3	0.00046
2/1/16	0.00109	88.2	0.00036
3/3/16	0.00145	80.8	0.00044
4/6/16	0.00110	80.5	0.00034
5/2/16	0.00120	83.7	0.00038
6/1/16	0.00109	76.7	0.00032
7/6/16	0.00131	71.7	0.00036
8/1/16	0.00092	71.3	0.00025
9/1/16	0.00133	73.0	0.00037
10/5/16	0.00108	76.5	0.00031
11/1/16	0.00109	82.8	0.00034
12/1/16	0.00118	83.8	0.00037

Dioxin-TEQ: The 2014 NPDES Permit established an interim Effluent concentration limit for Dioxin-TEQ (toxic equivalence) of 6.3×10^{-5} ug/l and a monitoring frequency of twice per year. None of the 17 dioxin congeners were detected in Facility Effluent in 2014, 2015 or 2016.

Priority Pollutant Metals

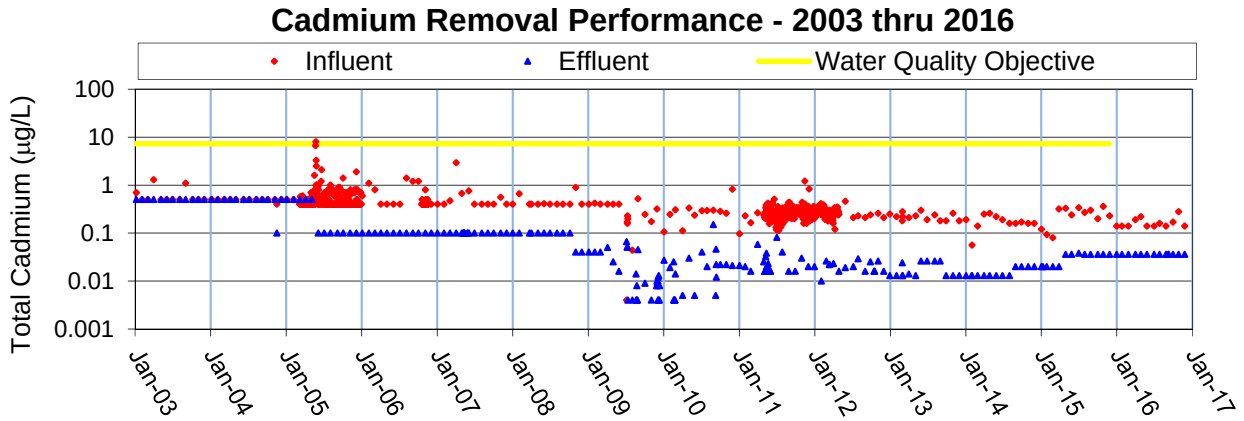
Arsenic:

Arsenic (ug/L)							WQO = 36 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	1.98	2.99	2.37	0.90	1.49	1.16	*51%*
2015	1.82	3.01	2.36	0.95	1.88	1.44	*39%*
2016	1.72	2.65	**2.17**	0.93	1.71	**1.24**	***43%***



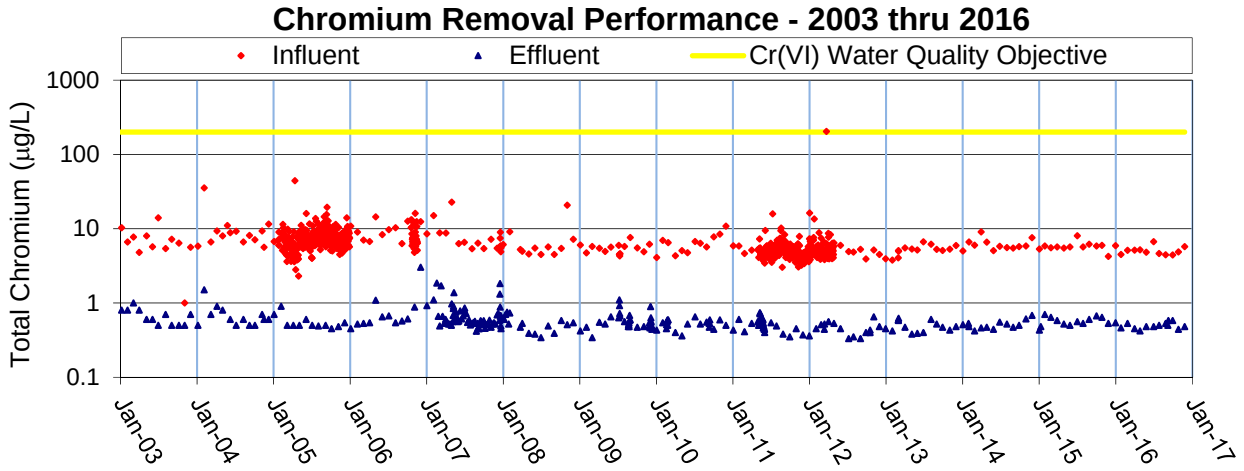
Cadmium:

Cadmium (ug/L)							WQO = 7.3 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	0.06(DNQ)	0.26	0.18	0.01(ND)	0.02(DNQ)	0.020	*91%*
2015	0.08(DNQ)	0.36	0.24	0.02(ND)	0.04(DNQ)	0.031	*87%*
2016	0.14(ND)	0.28(DNQ)	**0.17**	0.04(ND)	0.04(ND)	**0.031**	***78%***



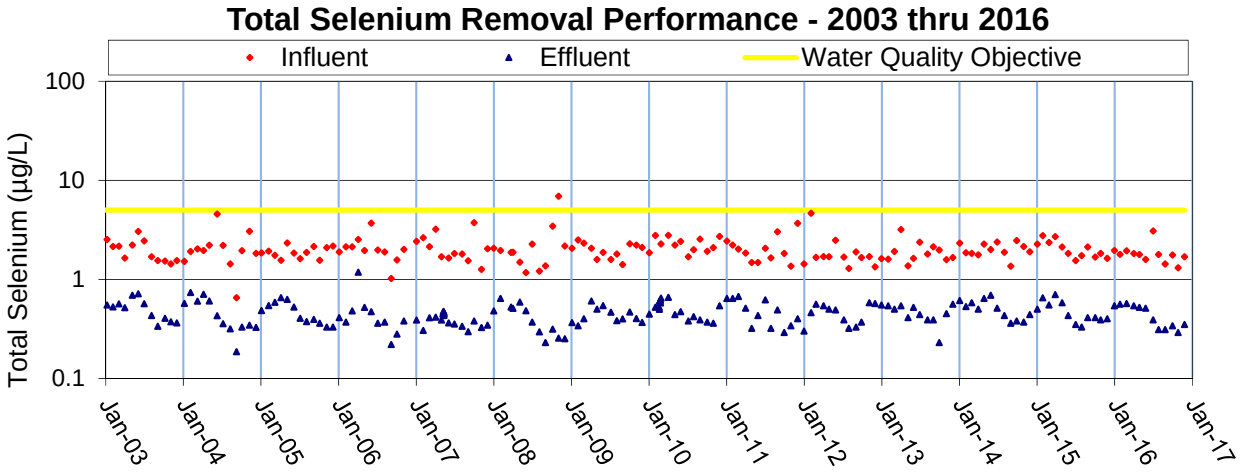
Total Chromium (substituted for Hexavalent Chromium): The 2014 NPDES Permit allows measurement of total chromium instead of hexavalent chromium in Facility Effluent.

Chromium (ug/L)							WQO = 180 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	5.02	9.05	6.19	0.42	0.68	0.51	*92%*
2015	4.24	8.03	5.79	0.43	0.70	0.58	*90%*
2016	4.42	6.68	**5.12**	0.42	0.58	**0.49**	***90%***



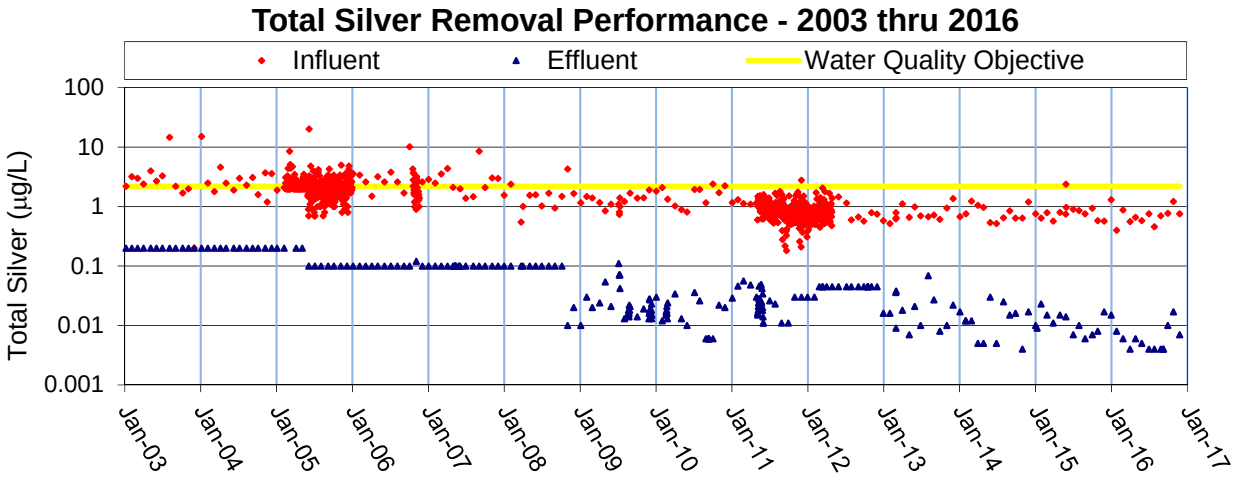
Selenium:

Selenium (ug/L)							WQO = 5 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	1.36	2.46	2.02	0.36	0.69	0.50	*75%*
2015	1.55	2.76	2.05	0.33	0.70	0.48	*77%*
2016	1.31	3.08	**1.83**	0.29	0.57	**0.44**	***76%***



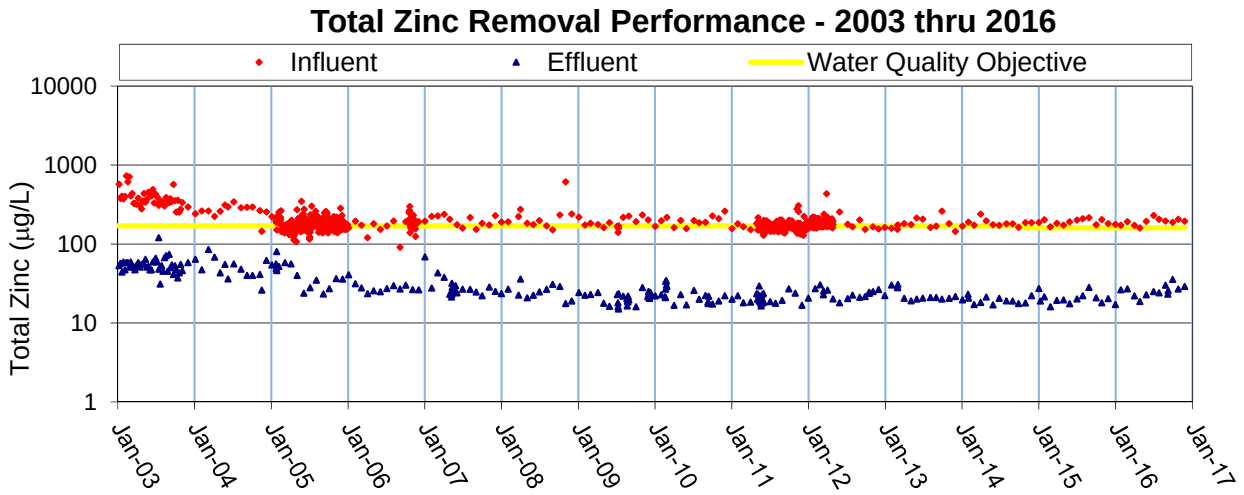
Silver:

Silver (ug/L)							WQO = 2.2 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	0.52	1.24	0.81	0.004 (DNQ)	0.030 (DNQ)	0.014	98%
2015	0.57	2.39	0.80	0.006 (ND)	0.023 (DNQ)	0.012	99%
2016	**0.40**	**1.31**	**0.76**	**0.004 (ND)**	**0.017 (DNQ)**	**0.008**	***99%***



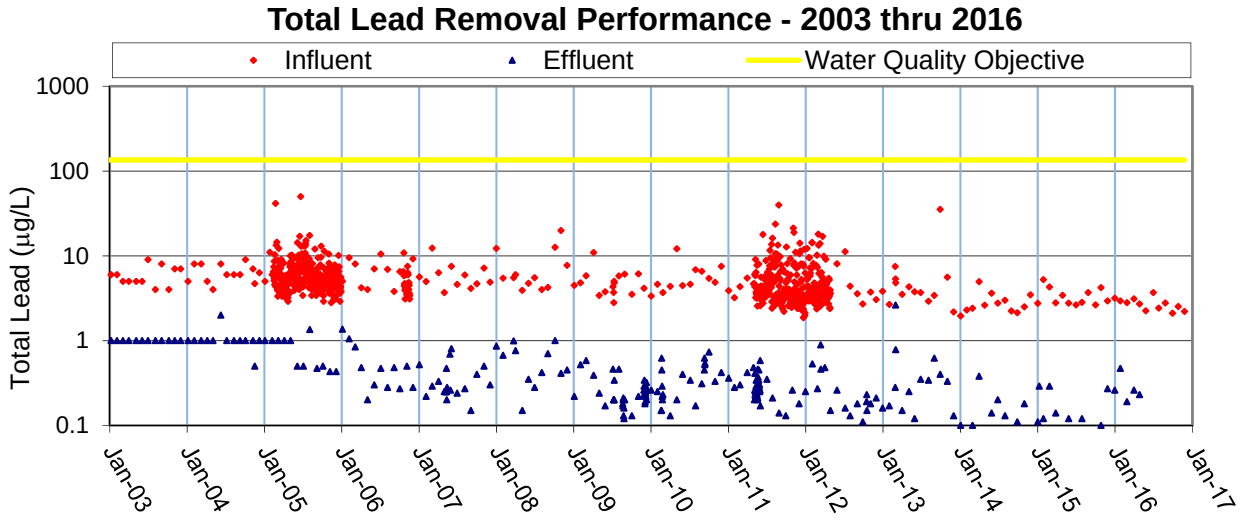
Zinc:

Zinc (ug/L)							WQO = 161 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	163	239	184	16.9	23.0	19.0	90%
2015	165	203	191	16.0	27.2	21.0	89%
2016	**160**	**230**	**190**	**17.1**	**35.6**	**25.0**	***87%***



Lead:

Lead (ug/L)							WQO = 135 ug/L
	Influent			Effluent			Removal
	Low	High	Average	Low	High	Average	
2014	1.95	4.95	2.83	0.06	0.38	0.14	*95%*
2015	2.64	5.24	3.35	0.08	0.29	0.14	*96%*
2016	**2.10**	**3.68**	**2.72**	**0.06**	**0.47**	**0.16**	***94%***



b) Other Metals

Antimony:

Antimony (ug/L)				WQO = 4300
	Effluent			Removal
	Low	High	Average	
2014	0.32	0.49	0.40	
2015	0.39	0.60	0.50	***NA***
2016	**0.39**	**0.55**	**0.45**	

Beryllium: Literature suggests chronic toxicity of beryllium may be as low as 5.3 ug/L.

Beryllium (ug/L)				WQO = NA
	Effluent			Removal
	Low	High	Average	
2014	0.005 (ND)	0.0270 (ND)	0.014	
2015	0.020 (ND)	0.0270 (ND)	0.022	***NA***
2016	**0.020 (ND)**	**0.0200 (ND)**	**0.020**	

Thallium:

Thallium (ug/L)				WQO = 6.3 (CTR)
	Effluent			Removal
	Low	High	Average	
2014	0.004 (ND)	0.36	0.096	
2015	0.039 (ND)	0.55	0.095	***NA***
2016	**0.056 (ND)**	**0.64**	**0.199**	

c) Organics

The Facility's NPDES permit requires semi-annual monitoring of organic priority pollutants in effluent. This monitoring frequency was modified by Order R2-2016-0008, the Alternative Monitoring and Reporting Requirements (AMR) for Municipal Wastewater Dischargers for the Purposes of Adding Support to the San Francisco Bay Regional Monitoring Program (RMP), effective April 1, 2016. The AMR reduces monitoring frequency from twice per year to once every five years if discharger pays additional fees to the RMP. The Facility opted to reduce monitoring frequency and pay additional funds into the RMP, so organic priority pollutants were only measured in February of 2016. Of 113 compounds analyzed, only three were detected in Facility Effluent in 2016.

Volatile Organic Compounds (VOCs): Three VOCs were detected in effluent in 2016. All VOCs were well below the most stringent water quality criteria (WQC) available.

Volatile Organic Compounds (ug/L)	February 2016	WQC
Chloroform	**3.8**	**NA**
Dichlorobromomethane	**1.2**	**46***
Toluene	**0.45 (DNQ)**	**200,000***

*Both Dichlorobromomethane and Toluene are based on human health criteria for the consumption of organisms.

Semi-Volatile Organic Compounds: No semi-volatile organic compounds were detected in Facility Effluent in 2016.

Legacy Pesticides: No legacy pesticides were detected in Effluent in 2016.

Polynuclear Aromatic Hydrocarbons (PAHs): No PAH compounds were detected in 2016.

Polychlorinated biphenyls (PCBs): In accordance with the Mercury and PCBs Watershed Permit, Permit # CA0038849, Order No. R2-2012-0096, PCBs are measured as total aroclors with USEPA method 608 for regulatory compliance. PCBs were not detected using this method. The Facility is also required to measure total PCBs by congener using USEPA Proposed Method 1668c quarterly for information only. Method 1668c data were collected in February, April, August, and October of 2016. PCBs congeners are reported as the sum of a subset of 40 congeners (SFEI 40) plus co-elutes. The SFEI 40 provided the basis for the impairment and loads assessments in the San Francisco Bay PCBs TMDL. PCBs as congeners were not quantified in any samples collected in 2016. Since April 2011, only three of 25 sampling events have quantified any PCBs congeners.

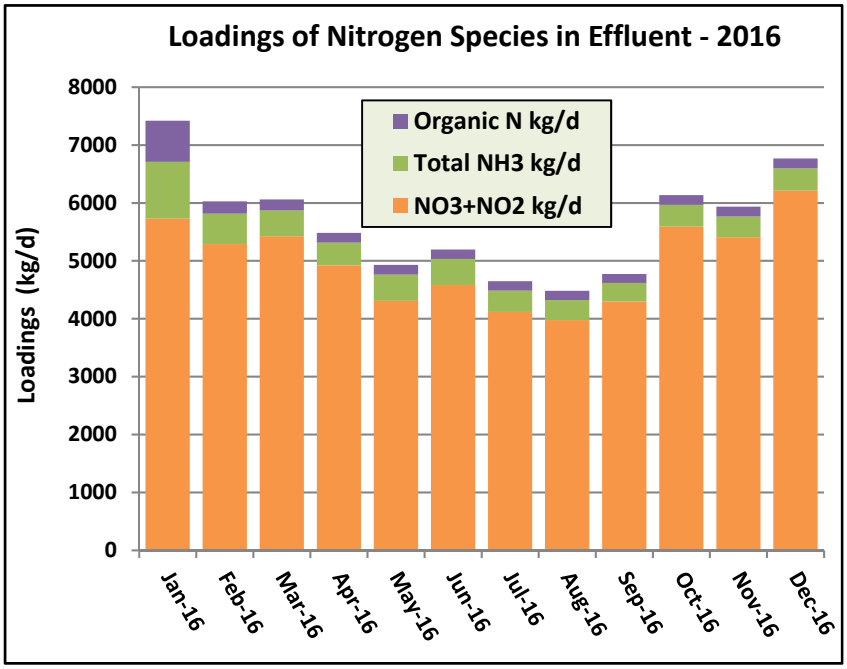
d) Nutrients

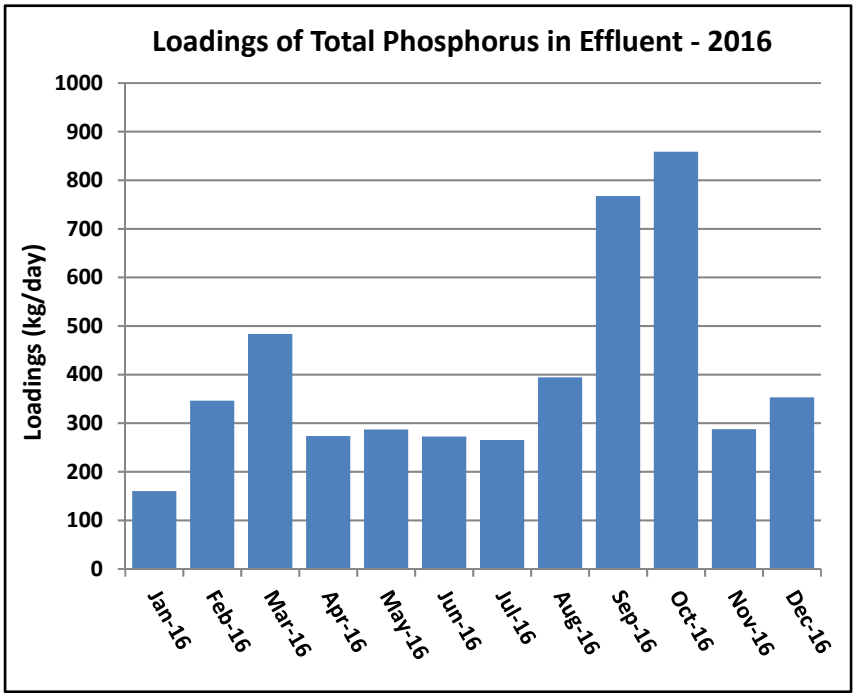
Effluent Nutrient Loadings in 2016. The Facility measures forms of nitrogen and phosphorus in effluent twice per month as required by the Nutrients Watershed Permit (NPDES No. CA 0038873, Order No. R2-2014-0014).

Nitrogen. Total Nitrogen (TN) is the sum of total ammonia (NH_3), nitrate (NO_3), nitrite (NO_2), and organic nitrogen.

The discharged load of TN averaged 5472 kg/day in 2016. This was mostly in the form of nitrate (NO_3).

Based on previously measured influent loads of 23,000 kg/day in 2013, roughly 76% of total nitrogen is removed through treatment.





Phosphorus. The discharged load of Total Phosphorus (TP) averaged 396 kg/day in 2016.

This compares to the measured influent load of 3040 kg/day in 2013. Thus the Facility removed roughly 87% of TP through treatment in 2016.

3) Whole Effluent Toxicity

Acute Toxicity: Quarterly final effluent monitoring showed no acute toxicity to the rainbow trout test species in 2016. All four 96-hour flow through tests showed 100% survival.

Acute tests are performed in accordance with EPA 2019 (EPA-821-R-02-012) "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms." The Facility NPDES permit requires: a 3-sample median test result of not less than 90% survival and a single-sample maximum of not less than 70% survival.

Since 1994, facility effluent has never failed this acute toxicity test. Larval rainbow trout generally survive better in facility effluent than in laboratory control water.

ACUTE TOXICITY TEST
Larval Trout

ENDING DATE	EFFLUENT SURVIVAL	CONTROL SURVIVAL
01/26/13	100	100
02/28/13	100	100
03/22/13	100	100
04/19/13	100	100
05/17/13	100	100
06/28/13	100	100
07/26/13	100	100
08/23/13	100	100
09/22/13	97.8	100
10/19/13	100	97.8
11/16/13	100	100
12/13/13	100	97.8
01/17/14	100	100
02/14/14	100	100
03/21/14	100	100
04/25/14	100	100
05/23/14	100	100
06/27/14	100	100
07/25/14	100	100
08/29/14	100	100
09/26/14	100	100
10/24/14	100	100
11/21/14	100	93.3
01/31/15	100	100
04/24/15	100	100
07/24/15	100	100
10/23/15	100	100
02/12/16	100	100
04/22/16	100	100
09/20/16	100	100
10/11/16	100	100

Survival of rainbow trout in quarterly acute toxicity tests.

Chronic Toxicity: Monthly chronic toxicity testing with *Ceriodaphnia dubia* (water flea) yielded a pair of results that triggered accelerated monitoring in September 2016. All other results were non-toxic.

The Facility has used Ceriodaphnia dubia (water flea) chronic toxicity tests since 1994. Tests are performed in accordance with EPA 1002 (EPA-821-R-02-013) Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. "Chronic Toxic Units" (TUc) are calculated by dividing the highest concentration tested (100%) by the "25% Inhibition Concentration" (IC25). The IC25 is the calculated concentration at which Ceriodaphnia reproduction in effluent is reduced, or inhibited, by 25% compared to Ceriodaphnia in control water. Accelerated monitoring is triggered by a 3-sample median value >1 TUc or a single sample result $\geq$ 2 TUc.

The August test detected 1.3 Chronic Toxic Units (TUc). The September test registered 1.4TUc. Two tests in October, under an accelerated testing schedule, did not detect toxicity (both tests less than 1 TUc). October results de-triggered accelerated monitoring, so 13 chronic tests were performed in 2016.

Follow on investigations are conducted when persistent toxicity is detected. The investigations are known as Toxicity Identification Evaluations (TIEs) or Toxicity Reduction Evaluations (TREs). However, EPA's "Guidance for Phase I TIE" report explains that investigation of very low magnitude toxicity, less than 2.0 TUc, is difficult, if not impossible. EPA guidance warns that the investigations to remove and identify compounds causing low magnitude toxicity are likely to be inconclusive if toxicity is less than 2.0 TUc.

CHRONIC TOXICITY TESTS - 2016 (% Effluent)

Test Start Date	SURVIVAL		REPRODUCTION				
	NOEC	LOEC	NOEC	LOEC	IC_{25}	TUc	TST
1/19/2016	100	>100	100	>100	>100	<1	Pass
2/5/2016	100	>100	100	>100	>100	<1	Pass
3/11/2016	100	>100	100	>100	>100	<1	Pass
4/8/2016	100	>100	100	>100	>100	<1	Pass
5/6/2016	100	>100	100	>100	>100	<1	Pass
6/10/2016	100	>100	100	>100	>100	<1	Pass
7/12/2016	100	>100	100	>100	>100	<1	Pass
8/25/2016	100	>100	50	100	79.17	1.3	Fail
9/13/2016	100	>100	50	100	70.72	1.4	Fail
10/7/2016	100	>100	100	>100	>100	<1	Pass
10/13/2016	100	>100	100	>100	>100	<1	Pass
11/9/2016	100	>100	100	>100	>100	<1	Pass
12/8/2016	100	>100	100	>100	>100	<1	Pass

Two tests triggered accelerated monitoring in Sept. 2016.

CHRONIC TOXICITY SUMMARY Ceriodaphnia

Year	# Results Reported	# Results >1 but <2 Tuc	# Results >2 Tuc
1994	12	0	0
1995	11	0	0
1996	13	1	1
1997	12	2	0
1998	12*	3	0
1999	14	0	2
2000	12	0	0
2001	12	0	0
2002	12	0	0
2003	12	0	0
2004	12	0	1
2005	12	0	1
2006	11	0	0
2007	13	0	1
2008	12	0	0
2009	14*	1	2
2010	19*	3	2
2011	14	2	1
2012	13	1	1
2013	14	4	3
2014	12	1	0
2015	13	3	0
2016	13	2	0

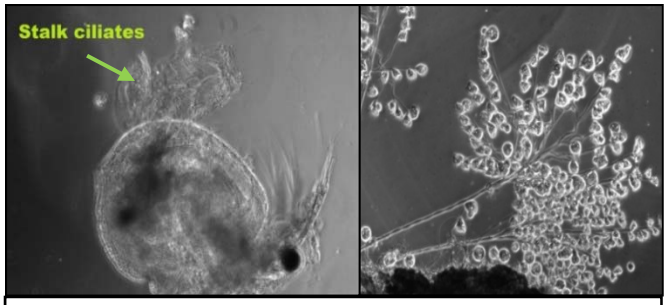
*Some results in 1998 & 2009/10 reflect duplicate tests.

Over a 23-year period, chronic toxicity was detected in final effluent on 38 occasions. 23 of those events were less than 2 TUc and 15 events were greater than 2 TUc. All detections since 2014 showed marginal toxicity at less than 2TUc and were non-persistent.

Despite the low magnitude and non-persistence of toxicity, Facility staff did undertake laboratory investigations to determine potential cause(s) for both August and September 2016 test results. Some observations were noted during TIE manipulations:

- Metals, pesticides, & PCBs were not at significant (toxic) concentrations for Ceriodaphnia dubia.
- Debris and stalked ciliates in final effluent samples immobilized a few animals. This affected survival and reproduction on extended exposure.
- Filtration with 60µm or 20µm nylon filters did not remove toxicity or stalked ciliates.

Cleaning of effluent composite lines reduced debris and stalked ciliates in effluent and has been incorporated into the Facility's monthly test procedures. No toxicity was observed in the subsequent October chronic test.



Ceriodaphnia dubia with attached stalked ciliates (right). Closeup of stalked ciliates (left).

2. FACILITY ANNUAL REPORT UPDATES

The following annual update reports are submitted in accordance with NPDES Permit Attachment G.

a. Wastewater Facilities Status Report

b. Operations & Maintenance Manual (O&M Manual) Update

c. Contingency Plan for Operations Under Emergency Conditions

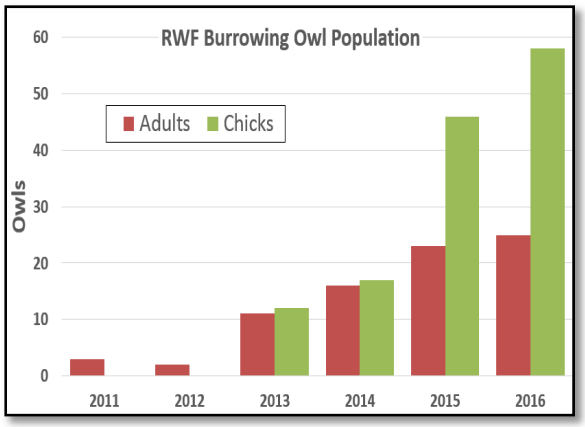
a. WASTEWATER FACILITY STATUS

NPDES Permit Attachment G requires annual update of Wastewater Facilities Status. This encompasses major wastewater facility operations or capital improvements over the past year. Activities that involve planning, assessing, and upgrading Facility assets are divided into six areas: 1) Property Management, 2) General Facility Status, 3) Operational Assessment, Infrastructure/Asset Management, Personnel, and Finance.

1) Facility Property Management

South Bay Shoreline Study. City staff continues to coordinate with the South San Francisco Bay Shoreline Study project sponsors: The US Army Corps of Engineers, the California Coastal Commission, and the Santa Clara Valley Water District. In 2016, funding was secured for design of the first phase of the levee, beginning west of the town of Alviso, and extending to the Union Pacific railroad line. City staff is participating in discussions with the project sponsors and regulatory agencies over the final levee alignment and potential construction staging areas located on Facility property, as well as negotiating the in-kind of contribution of the (Facility-owned) pond A18 for eventual restoration of salt marsh habitat after the levee is completed.

Burrowing Owl Habitat. In August 2016, Santa Clara Valley Habitat Agency was assigned owl habitat management in Facility bufferlands through a short-term management agreement. The agreement preserves 201 acres for owl habitat over the next five years. The Habitat Agency contracted with Santa Clara Audubon Society and San Francisco Bay Bird Observatory to carry out the management plan. In the next few months, 72 of the 201 acres will be formally enrolled into the Habitat Agency's reserve system in-lieu of paying $1.4 million fees for four Facility Capital Improvement Program projects. Facility bufferlands continue to be the single thriving owl habitat in the region. Unfortunately, all other habitats in the South Bay are in decline.



The 2016 breeding season was the fourth consecutive year of substantial growth in owl population. Last year there were 20 adults and 46 chicks; this year had 25 adults and 58 chicks, representing a 25% increase.

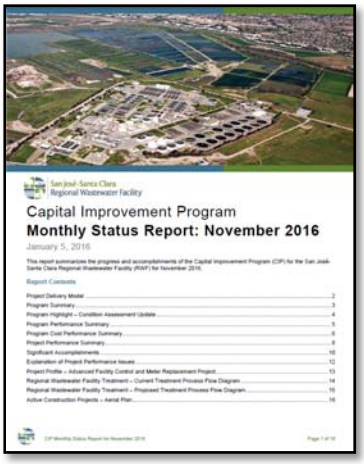
2) General Facility Status

a) Capital Improvement Program Monthly Status Reports

Monthly CIP status reports and many other CIP status update documents are available at this web address: http://sjenvironment.org/CivicAlerts.aspx?AID=1727

or use simplified web address http://sjenvironment.org/cip

An easy way to find the reports without the web link is to google the words: "San Jose Wastewater CIP"; the top hits will take you to the San Jose website and the reports themselves in pdf format.



b) Power

Generators & Fuel Cell. Four Engine Generators are available for power generation.

The Facility stayed within budget for gas and electricity purchase form PG&E and did not exceed the 25,000-ton Cap and Trade CO^2 emissions restriction in 2016. Cap and Trade rules require that a facility continue to purchase carbon credits for a three-year compliance period after exceeding the 25,000-ton threshold. Thus, the RWF will remain under the trading program until 2018.

Engine-Driven Generators & Fuel Cell

Generator	Location	Capacity (KW)	Year Built / Overhauled	Operational Status
E-2	P&E Building	800	1953/2002	In Service
E-5	P&E Building	1,750	1962/2008	In Service
EG-1	Building 40	2,800	1994/2015	Out of Service
EG-2	Building 40	2,800	1983/2009	In Service
EG-3	Building 40	2,800	1983/2013	In Service
Fuel Cell	East Side	700	2012	Out of Commission
Total Capacity		**8,150**		

- Four new 3 MW emergency backup engines were installed at by contractor Anderson Pacific in 2016. A third-party testing report for the Emergency Diesel Generator Package was submitted to PG&E for review and approval in October 2016. A "Black Start" test of these new generators is planned in early 2017. After testing, the new emergency diesels will be certified and activated for standby to conclude this $15.2 million project.
- EG-1 was taken out of service in September until final certification of new emergency backup generators in early 2017. EG-1 is being fitted with new electrical (switchgear) panel and generator controls that will allow communication with the new backup

One of four emergency generators slated to go online in 2017.

generators. Sometime later in 2017, EG-1 will be taken offline again for a limited in-house "top-end" overhaul.

- EG-2 is available for use, but used sparingly. The engine is at its high-hour threshold, but overhaul is not planned in anticipation of installation of new cogeneration engines around 2019.
- Both EG-2 and EG-3 have been upgraded with the same panels and controls as EG-1. In 2017, the switchgear regulating these two generators will be upgraded so that all three EG units will communicate with the new emergency generators.
- The two oldest remaining engines (E-2 and E-5 in the Power & Energy building) are scheduled to decommission once the 3 MW emergency generators come online.
- The fuel cell is out of commission indefinitely.

Existing Engine Generator, EG-2

Blowers: Three large capacity electric Process Air Blowers (PABs) are located in Building 40. These are currently functional and reliable but run sparingly due to electrical cost. These units will be run more regularly when the six engine-driven blowers are decommissioned soon. There are plans to outfit these three large PABs with Variable Frequency Drives (VFDs) to increase operational flexibility and reduce electrical cost.

3 Electric Blowers
Building 40

Blower	Capacity (BHP)	Startup Date	Operational Status
PAB-1	4,000	1983	Standby
PAB-2	4,000	1983	Standby
PAB-3	4,000	1983	Standby

6 Engine-Driven Blowers
Secondary Blower Building

Blower	Capacity (BHP)	Startup Date	Operational Status
SBB A1	2,345	1962/64	In Service
SBB A2	2,345	1962/65	In Service
SBB A3	2,345	1962/66	In Service
SBB B1	1,855	1962/67	Out of Service
SBB B2	1,855	1962/68	In Service
SBB B3	1,855	1962/69	In Service

Five of the six engine-driven blowers in Secondary Blower Building (SBB) are operational. Blower A-1 was restored to service in December 2016. Blower B-1 remained out of service due to a failed thrust bearing. Four of these six old blowers, also known as "Coopers," built by Cooper-Bessimer Corp, are slated for decommissioning. The remaining two units will be converted with electric motors under current plans.

Four of five "Tertiary Building Blowers" (TBBs), also known as nitrification area blowers, are operational. Blower N-5 continues to be out of operation due to an inoperable air discharge valve but is otherwise mechanically sound.

5 Electric Blowers
Nitrification Building

Blower	Capacity (BHP)	Startup Date	Operational Status
TBB N1	2,250	1979	In Service
TBB N2	2,250	1979	In Service
TBB N3	2,250	1979	In Service
TBB N4	2,250	1979	In Service
TBB N5	2,250	1979	Out of Commission

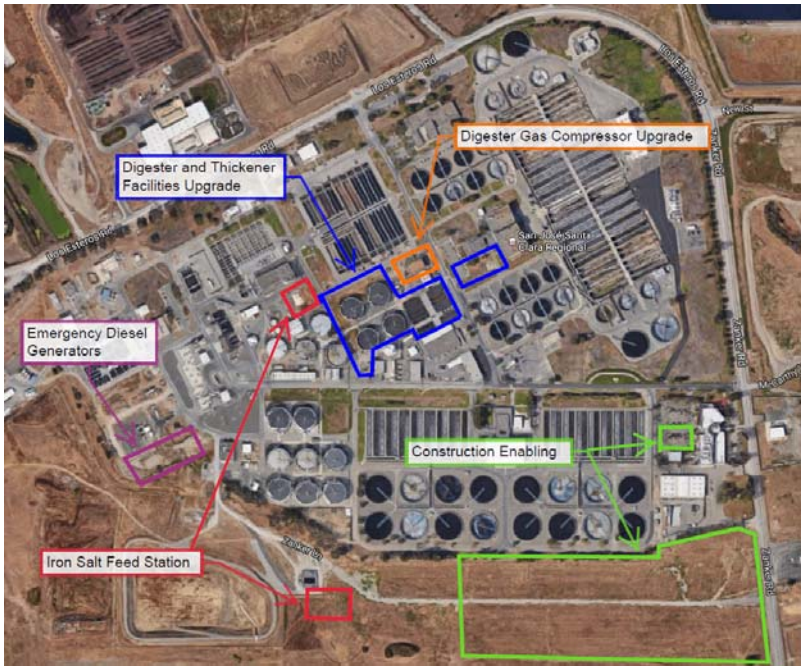
c) General Maintenance & Construction

The following general maintenance projects were performed in 2016:

- Construction Enabling Project. Site preparation began for construction of a multi-acre trailer hook-up, security entry, parking, and lay yard area immediately south of the RWF. Work includes siting an additional construction management trailer building in the west parking lot of the Environmental Services Building. Scheduled completion in April, 2017
- City of San Jose Public Works Department relined roughly 4000 feet of Interceptor #4, from Structure A to Hwy 237. A Cured-in-Place-Pipe (CIPP) sleeve was installed in the 84-inch line at a cost of roughly $3.7 million.

Painting. The following buildings and major equipment were painted or maintained.

- **Nitrification Basement A-Side Aeration Tunnel:** prepped, patched, primed and painted.
- **Secondary Clarifiers A5, A7 and B3, B5 and B12:** All metal fixtures and equipment abrasive blasted, prepped, primed and coated.
- **Digester #10**: Under this $200K painting project, the digester center roof dome was abrasive blasted inside and out and then primed and coated to enable contracted repairs of roof leaks. Then, digester interior, exterior, and heat exchanger were abrasive blasted, primed, and finished. The digester was restored to full service by late summer.
- **Disinfection Buildings**: Three buildings and four Sodium Bisulfite tanks were pressure washed and touched up. Prepped, primed and painted valve stanchions and bollards.
- **East Primary SW Scum Pit**: Painted pumps, motors and piping in East Primary South-West Scum Pit (80% complete).
- **Grease Building:** Painted grease pumps #1 and #2 in Grease Room basement.
- **Nitrification Building**: Prepped, primed and painted stairwells in Nitrification Building.



d) Condition Assessments and Studies

Blower Improvements Condition Assessment. This assessment was performed by San Jose-Santa Clara RWF CIP engineers with representatives from Howden-Root, Inc. in April 2016.

Assessment team inspecting blower TBB-3

All blowers were found to be in very good condition. "It is apparent that preventative maintenance has been practiced consistently ... The consensus was that existing blowers will perform satisfactorily for another 20-30 years." This assessment was based on partial disassembly and inspection of electrical blowers having the highest operational hours: PAB-2, & TBB-3, and engine blower SBB-B2.

The assessment determined that electrical switchgears, circuit breakers, and motor control centers should be reconditioned and some parts replaced. Similarly, blower control panels were found to be old, inconsistent, and incompatible with modern full automation capability.

Filter Rehabilitation Project – Condition Assessment & Alternatives Assessment. A draft report was submitted in November 2016. Five filtration system processes were evaluated:

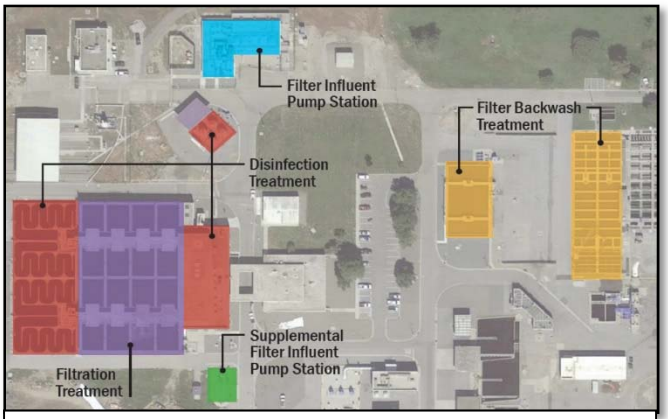
1. Filter Influent Pump Station (FIPS) = Fair condition. Structure and pumps were rated "Fair." Piping, valves, electrical equipment, and controls within FIPS are in somewhat better condition and were rated at Fair to Good. The estimated Remaining Useful Life (RUL) of components ranged from nearly 30 years for piping to "end of useful life" estimates for valves and electrical components. Controls, pumps, and structure have estimated RULs of 6 to 15 years.

2. Supplemental Filter Influent Pump Station = Very Good condition. All components are rated Very Good. With exception of the controls, all components of SFIPS have estimated RULs of more than 20 years.

3. Filtration Treatment = Poor condition. The structure and pumps are rated Good and Fair respectively. 1979-era Piping, valves and electrical facilities are generally in Poor condition. Piping, structure, and controls have estimated RULs 4 to 12 years. Pumps, valves, and electrical system are at the end of their useful lives.

4. Filter Backwash Treatment = fair to poor condition. Condition varies significantly from component to component. Flocculation and Sedimentation Basins require extensive upgrading while Equalization Basin structure is rated as Very Good. The equalization basin and piping have estimated RULs of over 20 years, but most components are judged to be near to or at end of useful life.

5. Disinfection Treatment = fair condition. Drain line piping is the only component rated Poor due to a plug in the Chlorine Contact Tank (CCT). Components of Disinfection Treatment are judged to be at or very near to end of their useful lives with exception of the electrical and control system installed in 2007.



Filtration process is comprised of five process elements.

3) Operational Assessment

a) Headworks

Facility headworks include both a new headworks area (Headworks 2 or HW2) an old headworks area (HW1) and an upstream Emergency Basin Overflow Structure (EBOS) that receives flow from the main interceptor lines. Each headworks unit consists of bar screens and grit removal chambers to capture and remove screenings and grit material.

- Pipe and Plant Solutions, Inc. performed an expedited $60,000, 7-day, cleaning of the Emergency Basin Overflow Structure (EBOS). 568 yards of grit and sediment had accumulated in EBOS compartment B and was compromising its operation. Cleaning the material involved draining the compartment, lowering a bobcat tractor into the well for confined space operation, then pumping the consolidated material. A surprise finding was that concentration of Iron in the wet debris was about 31,000 mg/l. This indicates that ferric chloride (Fe_2Cl_3) for odor control contributes to accumulation of material in EBOS.
- Construction of $6 million Iron Salt Feed Station began in 2016. This project will install two tank farms: a four-tank ferric chloride farm and a one-tank polymer feed station. Both farms will be equipped with containment walls, canopies, and metering skid pumps. The work should be completed at the end of 2017.
- A new $1.5 million "Headworks Critical Improvements" contract was bid in late 2016 to address issues with Headworks 2 (HW2) equipment. This project will include installation of two Duperon Flex Rakes to replace the remaining two headworks bar screens in the HW2 area. The Duperon Flex Rake installed in 2014 performs better and more reliably than existing "Climber" bar screens. Flex rakes run on a continuous belt, plug less frequently, and require less maintenance. The unit is also enclosed for better odor control.

Duperon Flex Rake.

A project to construct a new third headworks facility (Headworks 3 or HW3) is in design phase. This new headworks will be located adjacent to current HW2 and will replace aging HW1.

b) Primary Clarifiers

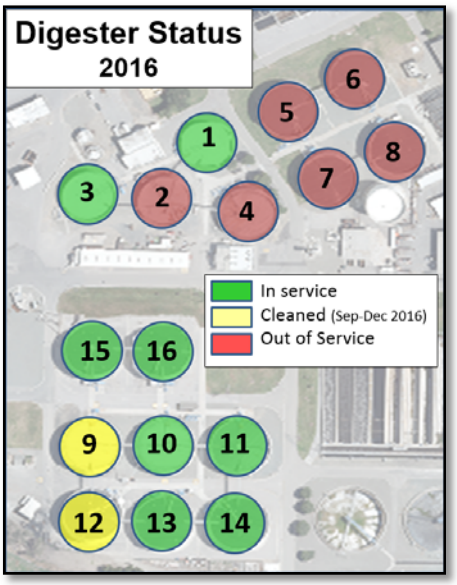
West Primary. The Facility maintenance section has been refurbishing tanks in the West Primary area over the past three years and the area is now in serviceable condition. All valves have been refurbished, stainless steel track has replaced old plastic track.

East Primary. Primary clarifier B4 was refurbished with new flights, chains and sprockets, and new weir troughs. Remaining fiberglass scraper flights in East Primary tanks have been replaced with aluminum.

c) Digesters, Gas, & Sludge

Digester Status. Eight digesters are currently in service.

- Digesters 9 and 12 were cleaned in September through December 2016 by Pipe and Plant Solutions, Inc. Roughly 200 tons of screenings and 70 tons of sand and grit were removed from each digester at a cost of $138K and $158K respectively. After digester 9 is restored to full service in 2017, digester 13 is next slated for cleaning.
- Digesters 2 & 4 have been out of service for several years due to structural degradation. There is no plan to restore these units.
- Digesters 5 thru 8 are out of service and in the process of being rebuilt as part of the $122M Digester and Thickener Facilities Upgrade project described below.



Digester and Thickener Facilities Upgrade Project

Work on this three-year, $122 million, project started in mid-2016 for completion in 2019. Digesters 5 thru 8 are being upgraded for thermophilic operation. Digesters 1 thru 4 will eventually be abandoned. Digesters 9 thru 16 will continue to be used for mesophilic anaerobic digestion under a "Time-Phased Anaerobic Digestion" TPAD design. Conversion of digesters 5 thru 8 to thermophilic "Hot" operation also requires overhaul of the Sludge Thickener facilities known as Dissolved Air Floatation Tanks (DAFTs).

- New digester feed, gas mixing, recirculation and discharge lines, elevated gas pipe racks, and emergency overflow systems will be installed

The DAFT tanks 1-6 are currently being rebuilt to new design. Sludge holding tanks 15 and 16 will also be upgraded. DAFT tanks 7-14 will eventually be abandoned. Digester sludge screening facilities and thickened sludge equalization tanks will be constructed to accommodate a greater volume and thickness of primary sludge to the thermophilic digesters.

Digester Gas Compressor Upgrade project

Work continues on this $12.9 million project to install two digester gas compressors with associated housing, cooling system, DCS control system, electrical and skid equipment. This system will ultimately tie together plant digesters and future cogeneration facility.

- In October and November 2016, contractor Anderson Pacific completed testing the cooling tower system and tied new compressor inlet and discharge piping to existing piping. In early 2017, Facility staff will be trained by manufacturer representatives on operation of the new Digester Gas Compressors. A 7-day test run on both compressors is scheduled for early 2017.
- The new large "dry-seal" gas holder passed a one-year Preventative Maintenance Warranty Inspection. The older, small gas holder has been decommissioned.

d) Biological Nutrient Removal (BNR)

The Biological Nutrient Removal (BNR) Process is carried out in two locations, historically referred to the "Secondary" and "Nitrification" areas. The two areas employ the same 4-stage BNR process and are run in parallel.

Secondary Area (BNR-1).

- An 18-month project to install new feed control valves in BNR-1 area was completed in November 2016. New 24-inch Bray "Butterfly" valves with Kennitrol pneumatic actuators and ABB TZID valve positioners were installed in each "east-end" primary effluent line feeding into the 3rd pass of secondary basins A-1 through A-6 and B-1 through B-6. The new valves, actuators, and positioners provide constant flow control and feedback. The new valve positioners can be controlled locally if needed and include a "Hold-Last" feature which maintains current valve positon when power or signal is lost.
- For liquid flow monitoring, eleven new 24-inch magnetic flow meters were installed to replace older air-actuated Differential Pressure (DP-cell) V-cone flow meters. Magnetic flow meters are more accurate and require less maintenance than older meters.
- Five clarifiers were repainted in BNR-1 area from April-October 2016: (A5, A7, B3, B5, and B12) by Murphy Industrial Coatings. The total cost of this project was $686K.

Nitrification Area (BNR-2).

- Nitrification/BNR-2 B-side was shut down from April thru September 2016 to allow replacement of fine-bubble diffusers in all tanks, 1 thru 8. The shutdown afforded opportunity to install new air valves and meters in B-side tanks. In prior years, anaerobic and anoxic tanks in BNR-2B area were fitted with new 18-inch Bray air flow valves with pneumatic actuators and TZID valve positioners. (These are the same actuators and valve positioners that were installed to control liquid flow in the BNR-1 area.) The new equipment worked so well that the 2016 shutdown period was used to install the same valves, actuators, and positioners in the remaining 8 aerobic tanks of the BNR-2B area.
- To improve control of air flow, new Kerrz thermal mass flow meters were installed in all 16 BNR-2B tanks. The more accurate Kerrz meters replace Differential Pressure (DP-cell) flow meters and pitot tubes. Thermal mass flow meters also track temperature to assess air flow with respect to specific gravity. This installation added an additional meter in each basin to allow control of air flow to each quad tank which alleviated an existing problem of balancing shared air flow between tanks.
- These same meters and replacement fine bubble diffuser sleeves will be installed in BNR-2 A-side tanks during summer shut down in 2017.
- Magnetic and thermal mass meters for liquid and air flow monitoring in BNR areas are much more accurate and eliminates significant head loss through V-cone flow restrictions.

Nitrogen Removal

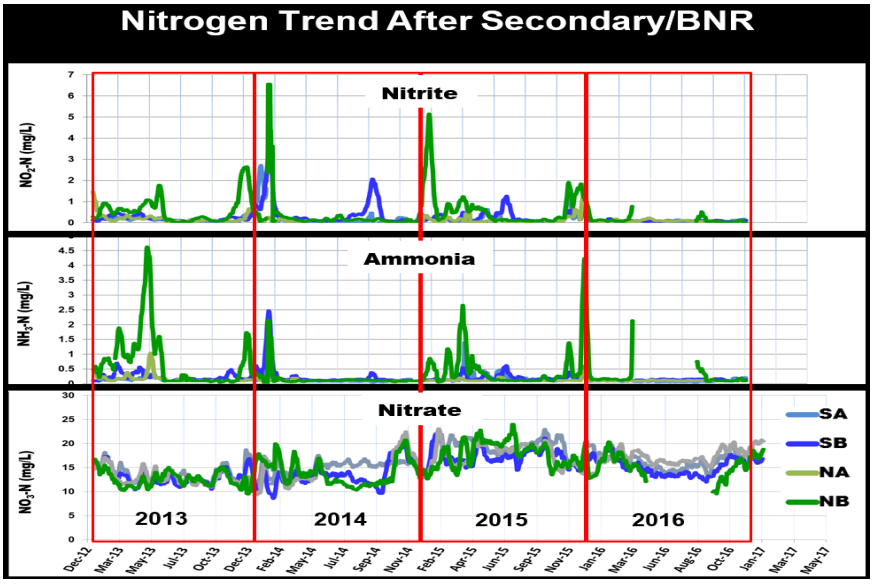
The BNR-1 and BNR-2 areas were each built as mirror-image A and B "sides." In each of the four BNR units, liquid feed, air flow, and solids wasting are operated independently. The operations of all four units are coordinated by the facility Chief Plant Operator and staff of operations superintendents and forepersons.

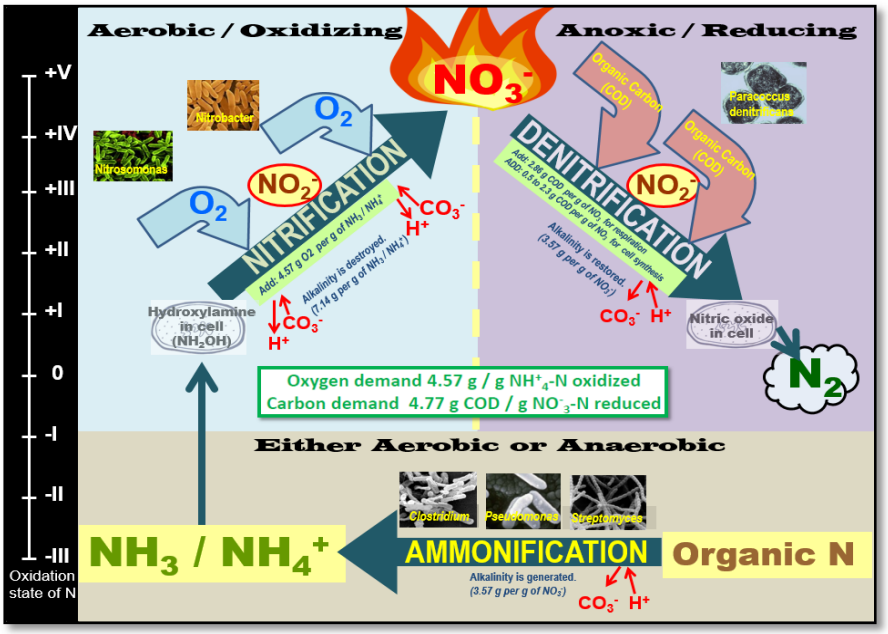
Effluent from each of the four units is analyzed for nitrate (NO_3), nitrite (NO_2) and ammonia (NH_3) at least daily. The results are used to track performance of each BNR unit.

Occasional ammonia or nitrite breakthrough occurs when aeration or microbial mass is not sufficient to oxidize ammonia. This typically happens during the cool months of the year when nitrifying bacteria experience the slowest metabolism.

Recent upgrades to secondary feed and aeration valves and controls, in addition to fine-bubble diffuser sleeve replacement, appears to have greatly reduced incidents of ammonia breakthrough.

On the right: Chart developed by process engineer, Dr. Rong Liu, to track nitrogen oxidation and removal in each of the four BNR process areas: Secondary (BNR-1) A & B, Nitrification (BNR-2) A & B.

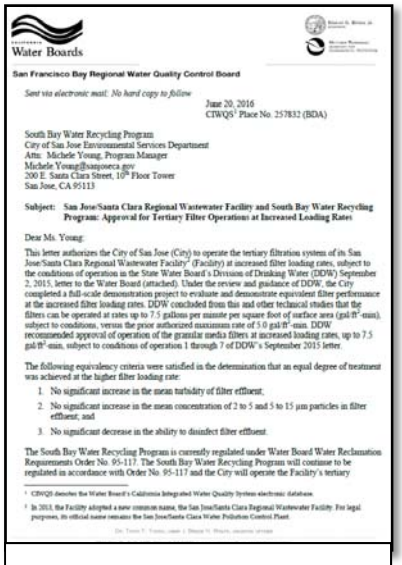




Left: Representation of nitrogen transformations through BNR process.
- At bottom, Ammonification: organic nitrogen is mineralized to ammonia.
- Left & up, Nitrification, ammonia is oxidized to nitrite then nitrate.
- Right & down, Denitrification: nitrate is reduced to nitrogen gas.

e) Filtration & Disinfection

Approval for higher filter flow rate. All secondary-treated wastewater at the SJ-SC RWF is filtered through 16 granular media (anthracite coal and sand media) filter beds arranged in four batteries. The fourth battery, filter beds B-5 thru B-8, is dedicated for non-potable water recycling. Effluent from this battery is diverted to the Bay when not needed for recycling.



Water Boards

San Francisco Bay Regional Water Quality Control Board

Sent via electronic mail: No hard copy to follow

June 20, 2016
CIWQS[1] Place No. 257832 (BDA)

South Bay Water Recycling Program
City of San Jose Environmental Services Department
Attn: Michele Young, Program Manager
Michele.Young@sanjoseca.gov
200 E. Santa Clara Street, 10th Floor Tower
San Jose, CA 95113

Subject: San Jose/Santa Clara Regional Wastewater Facility and South Bay Water Recycling Program: Approval for Tertiary Filter Operations at Increased Loading Rates

Dear Ms. Young:

This letter authorizes the City of San Jose (City) to operate the tertiary filtration system of its San Jose/Santa Clara Regional Wastewater Facility[2] (Facility) at increased filter loading rates, subject to the conditions of operation in the State Water Board's Division of Drinking Water (DDW) September 2, 2015, letter to the Water Board (attached). Under the review and guidance of DDW, the City completed a full-scale demonstration project to evaluate and demonstrate equivalent filter performance at the increased filter loading rates. DDW concluded from this and other technical studies that the filters can be operated at rates up to 7.5 gallons per minute per square foot of surface area (gal/ft²-min), subject to conditions, versus the prior authorized maximum rate of 5.0 gal/ft²-min. DDW recommended approval of operation of the granular media filters at increased loading rates, up to 7.5 gal/ft²-min, subject to conditions of operation 1 through 7 of DDW's September 2015 letter.

The following equivalency criteria were satisfied in the determination that an equal degree of treatment was achieved at the higher filter loading rate:

1. No significant increase in the mean turbidity of filter effluent;
2. No significant increase in the mean concentration of 2 to 5 and 5 to 15 µm particles in filter effluent; and
3. No significant decrease in the ability to disinfect filter effluent.

The South Bay Water Recycling Program is currently regulated under Water Board Water Reclamation Requirements Order No. 95-117. The South Bay Water Recycling Program will continue to be regulated in accordance with Order No. 95-117 and the City will operate the Facility's tertiary

[1] CIWQS denotes the Water Board's California Integrated Water Quality System electronic database.

[2] In 2013, the Facility adopted a new common name, the San Jose/Santa Clara Regional Wastewater Facility. For legal purposes, its official name remains the San Jose/Santa Clara Water Pollution Control Plant.

Higher filter flow rate approved.

Since the 1990s, regulations governing drinking water and water recycling, Title 22 of California Code of Regulations (CCR), imposed a filter flow rate limitation of 5 gallons per minute per square foot (gpm/sf^2) of filter surface area. This rule restricted Facility filter capacity and operational flexibility, particularly during high flow storm events.

Starting in 2007, SJ-SC RWF was one of six California facilities that collaborated in the "Filter Loading Evaluation for Water Reuse" (FLEWR) joint study under the National Water Research Institute (NWRI) and Water Reuse Foundation. Over 40 filter run tests at SJ-SC RWF demonstrated effective filtration at above the 5 gpm/sf^2 flow rate. Subsequently, SJ-SC RWF conducted additional comparison tests at 5 and 7.5 gpm/sf^2 flow rates using FLEUR protocols to demonstrate effective filtration at the higher rate.

In June 2016, State Water Board approved SJ-SC RWF for use of the higher filter flow rate (7.5 gpm/sf^2) for water recycling subject to the following limitations:

"Combined filter effluent turbidity should not exceed:

a) An average of 1.5 NTU within a 24-hour period.
b) 2.5 NTU more than 5% of time with a 24-hour period.
c) 5 NTU at any time."

Filter media replacement. Anthracite and sand media was replaced in filter beds A2, A6, and B3 between October 2015 and January 2016. These three filters continue to experience shorter run times of around 12 to 15 hours before backwashing is needed. This compares with 18 to 19 hour runtimes for all other 13 filter beds. Future contracts for media replacement will include provisions for more inspection of media before installation.

Process water pumps. Two 250 HP Sulzer process water pumps and a 110 HP low-flow pump were installed in 2016. The two high-capacity pumps have Variable Frequency Drives (VFDs). Each pump is designed deliver 4000 to 9500 gpm. Process water is now pressurized to 35 PSI by one high-capacity pump at any given time. The third, low-flow, 110 HP, 800-4000 gpm, pump maintains system pressure when demand is low. These pumps replace the last remaining 50-year old pump that close to point of failure. The new pumps provide process water pressure and consume less energy.

New Sulzer pumps.

Unintended Process Bypass – 20 July 2016

On July 20th at 8:19 AM, a manual isolation valve connecting the Filter Influent Pumping Station (FIPS) discharge header to a mixing well that that leads to the outfall channel and final point of discharge was inadvertently opened for seven minutes. This allowed a slug of secondary treated wastewater to mix with facility final effluent that flows to Artesian Slough. Although the duration was short, this incident occurred during a high flow period. 952,778 gallons of secondary treated wastewater is estimated to have discharged into the outfall channel.

1. The seven-minute release of water bypassed filtration and disinfection and discharged to a roughly ½ mile long outfall channel that is separated from Artesian Slough receiving water by a weir structure. The retention time in the 16 MG outfall channel was roughly 2 hours which allowed secondary treated water to mix with fully treated water before spilling into Artesian Slough.

2. This incident was reported to California EMA at approximately 10:30 AM (control number 16-4390). The entire area of Artesian Slough was visually monitored from midday until 8 PM to observe and discourage any public contact with compromised discharge. No fishing, hunting or any other public presence was observed.

3. The outfall channel and Artesian Slough were observed throughout the day. There were no odors, discoloration of water, or any impact on biota observed. Photos were taken to document presence of fish and waterfowl.

4. Additional samples were taken during the entire day following the incident. Analysis of water samples showed no exceedance of water quality standards.

5. After securing the manual isolation valve, it was subsequently locked shut and tagged to indicate that it is not to be opened except in emergency circumstances. System schematics were reviewed to identify all valves that allow similar bypass of wastewater processes. Additional training focused on the ten valves similarly connected to bypasses to the outfall channel was added to the facility O&M Manual (see images below).

As noted above, the spill was reported to California Office of Emergency Services and Water Board within two hours after the event. Subsequent 24 hour and five-day reports were submitted to Water Board via email on 21 July and 26 July, respectively.

The bypass event was also reported by local news services:
http://www.eastbaytimes.com/california/ci_30158795/952-000-gallons-partially-treated-sewage-flows-into

Ten valves that can bypass portions of treatment

Filter Influent Pumps (FIPs) Bypass Valves:
1. from FI pump 1 – 54/1 – Secondary Effluent
2. from FI pump 2 - 54/2 - Secondary Effluent
3. from FI pump 3 – 54/3 - Secondary Effluent
4. from FI pump 4 – 54/4 - Secondary Effluent
5. from FI pump 5 – 54/5 - Secondary Effluent
6. Old Mixing Well Isolation Gate - Secondary Effluent

Filter Building Bypass Valves:
7. Serpentine 1 FI Bypass valve – non-filtered effluent
8. Serpentine 2 FI Bypass valve - non-filtered effluent
9. Serpentine 3 FI Bypass valve - non-filtered effluent
10. Serpentine 4 FI Bypass valve - non-filtered effluent

Effluent Sampling Results Week of 20 July

	18 July	19 July	20 July AM/PM	21 July	22 July
pH	7.6	7.6	7.5/7.5	7.6	7.5
DO	6.9	7.0	6.6/7.1	7.2	7.1
Turbidity	0.9	1.0	0.5/1.1	1.1	1.1
Chlorine Residual	0	0	0/0	0	0
Ammonia	0.48 (by SFA)	0.59	0.48 (at weir)	0.49	0.50
BOD		3.4	3.1 (at weir)	3.2	
TSS		1.3	3.0 (at weir)	1.3	
Enterococcus	2	4	1/27	<1	5

Enterococcus Bacteria grab samples (MPN/100ml) collected at approximately 3:50 PM, 20 July

EFF 001	Outfall Daylight	Outfall Weir

Black Font: Regular compliance samples.

Green Font: Ammonia by *Segmented Flow Analyzer* (SFA).

Red Font: Grab samples after release event.

There were no exceedances of effluent limits during the event.

4) Plant Infrastructure / Asset Management

Asset Management Group.

The Asset Management Group oversees implementation of the Computerized Maintenance Management System (CMMS) and the Geographic Information System (GIS).

CMMS. Infor Enterprise Asset Management (EAM) tracks life cycle acquisition & maintenance cost of over 15400 vertical & linear assets.

Material management is provided by tracking over 5300 warehouse inventory items as well as 3100 pieces of equipment through direct material purchase by various shops. Preventative maintenance is managed for over 2,300 pieces of equipment and machinery. Work and purchase orders generated through CMMS system track and analyze labor and material costs and build up a work order history for future reference. During 2016, over 3100 regular work orders and 3300 Preventive maintenance work orders were created and executed by various shops and facility staff.

The RWF has been using Infor EAM since July 2009. An upgrade to version 11 was installed on May 18th, 2016, after months of testing and training. Full implementation of Infor EAM v.11 software was complete in August 2016. This latest version will allow integration of CMMS and GIS software systems and adds capability to access CMMS using mobile devices which should help facilitate work order submission and tracking. An in-house CMMS group trainer provides regular training on EAM modules.

Another smaller software upgrade to v.11.2 will be installed in 2017. This follow-up software will provide additional data entry capability to add work order closing codes, optimize book labor hours through the work order system, and provide integration of CMMS and GIS software systems. Integration with GIS software is a very important feature because, to date, almost all horizontal assets (pipes, underground tanks, manholes, electrical conduits, etc.) could only be tracked in GIS but not CMMS. Vertical assets continue to be tracked in CMMS.

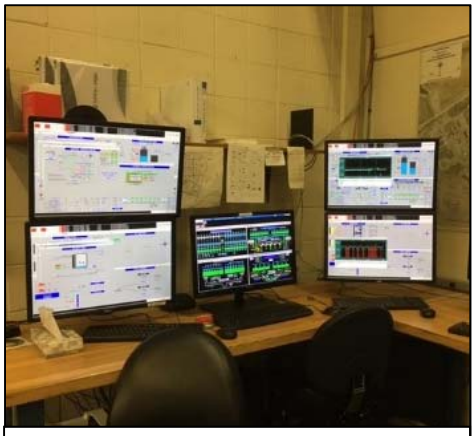
GIS. The three-person GIS team supports the Subsurface Utilities Damage Prevention Program which has been maintained since 2009.

A utility van was purchased in 2016 to house and transport GIS field equipment used to find buried pipes. On display in the photo, from left to right, are 1) the Ground Penetrating Radar (GPR), 2) Pipe/Cable Locator, and 3) High-Accuracy Global Positioning System (GPS). The equipment is used to accurately locate and map subsurface utilities.

New GIS van with locator equipment.

Process Control Systems. The Process Control team maintains the automated systems and software that monitor and report thousands of process parameters throughout the facility.

Distributed Control System (DCS) Upgrade Project. This multi-year project is upgrading both the electronic hardware and software that collects data and remotely controls thousands of pieces of equipment around the facility.



An old DCS display (center screen) with new system screens on left & right.

Phase I was completed in 2015. This work switched the old NoVAX computer equipment to the ABB System 800xA DCS platform. A new computer network was installed, and new terminals were deployed, with new Human Machine Interface (HMI) displays.

Phase II involves physical rewiring of over 7,700 I/O hard-wire points into new S800 interconnection interfaces. This work is now 92% complete and will be substantially finished in the next year. But the job grows even as work is accomplished: New points are continually added as new equipment is installed.

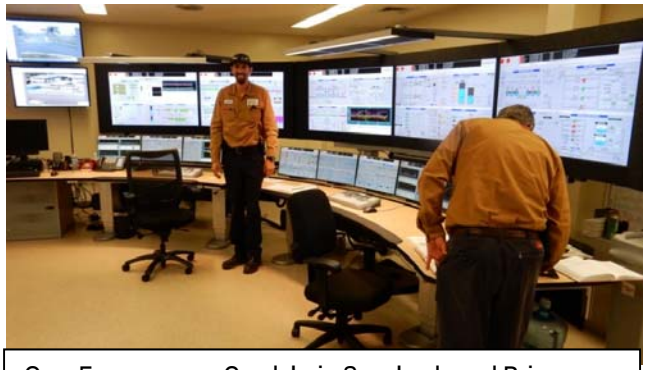
HMI flat panel touch-screens fitted with System 800xA graphics and animations.

Phase III, programming of new controllers to match existing programs and controllers, is still in being evaluated to develop a contract scope of services. This work should begin sometime in the next year. This final phase will replace old controllers and circuit boards with, smaller, smarter modules.

Even though Phase I was completed, installation of new HMI displays continues as electronic monitoring capabilities expand. In 2016, additional HMI displays were installed on engines and equipment around the Facility. Instrument technicians worked on HMI software with the goal of providing operators with the same visual display in the field as they see on a regular System 800xA DCS terminal in the office or computer room.

New computer room. A new computer control room was installed and became operational in September 2016. The new room is a standard control room design by ABB Control Solutions that features ergonomic design and large screens and controls that tie into the System 800xA DCS.

The room configuration is a standard catalog item provided by ABB and is featured on their corporate website: http://new.abb.com/control-rooms.



Ops. Forepersons, Candelario Sepulveda and Brian Boardman at work in the new ABB Computer Room.

5) Personnel

Overall. The Facility is supported by three principal divisions: Operations, Mechanical Maintenance, and Energy and Automation. An Asset Management group also reports directly to the Deputy Director. Additional support is provided by the Capital Improvement Program, the Sustainability and Compliance Division, and Facility Environmental Laboratory.

Facility operations and maintenance staffing totaled 212 positions, with 37 vacancies as of January 1st, 2017. Two operator, and two mechanic positions temporarily supporting CIP projects were deleted. Two positions, an Industrial Electrician and an Instrument Control Technician, were created early in 2017.

Current vacancies include: 1 Deputy Director, 2 Air Conditioning Mechanics, 2 Industrial Electricians, 2 Instrument Control Technicians, 1 Office Specialist, 1 Painter, 2 Senior Engineers, 1 Senior Heavy Equipment Operator, 1 Senior Instrument Control Tech, 1 Senior Painter, 5 Wastewater Attendants, 6 Wastewater Mechanics, 2 Wastewater Mech. Supervisors, 1 Wastewater Mech. Superintendent, 4 Wastewater Operators, 4 Wastewater Operations Forepersons, & 1 Wastewater Senior Mechanic.

Operations Division. Facility Operations is assigned 74 positions. A minimum of eight personnel are on site at all times under oversight of a Wastewater Operations Foreperson. Five Shift Forepersons and five Computer Room Forepersons monitor and supervise overall Facility operations in shifts that provide 24-hour coverage.

Seven Wastewater Superintendents oversee the following functional areas: 1) computer room and shift forepersons; 2) training and scheduling; 3) primary and sludge control treatment; 4) biological nutrient removal treatment; 5) filtration and disinfection treatment; 6) residual solid management; and 7) liaison for capital improvement projects. Superintendents are staffed with at least 6 Wastewater Forepersons assigned to each treatment area (16 total). Wastewater Superintendents and Forepersons rotate through area assignments roughly every two years.

Facility Maintenance Division. 66 positions are organized in three sections:

- Mechanical Process Maintenance and CIP Support - repairs and maintains all mechanical equipment including, pumps, piping, rotating equipment, and structures, as well as provides design review and assistance in construction.
- Training, Scheduling, and Special Projects - administers and develops technical training for Wastewater Attendants Mechanics; researches and procures parts for mechanical equipment work orders; plans and schedules large maintenance projects.
- Facilities and Maintenance - provides protective coatings; maintains all buildings on site and is responsible for landscaping, warehouse, and buffer land management.

Energy and Automation Division. 59 positions maintain electrical infrastructure, power generation, instrumentation, and process control systems. They are organized in four sections: Electrical, Instrument Control, Power & Air, and Process Control. This Division also oversees Facility energy use and purchase of natural gas and electricity.

CIP Division. This division is assigned 50 positions from Environmental Services Department (ESD) and 21 from Public Works. 17 positions are currently vacant. CIP division is comprised of 5 groups: Program Management, Power & Energy, Solids, Liquids, and Process Engineering.

Environmental Compliance and Safety. Regulatory compliance and land use planning is overseen by 15 positions in ESD Sustainability and Compliance Division. These personnel are environmental and regulatory analysts who monitor, report, and handle corrective action related to NPDES permit, air emissions permit, and health and safety regulations.

Environmental Laboratory. The Facility's on-site laboratory is staffed with 28 personnel: 13 laboratory chemists, biologists and technicians support wastewater operations. The remainder of laboratory staff perform trace analytical work and client services.

6) Finance

The Facility operates through a Joint Powers Agreement (JPA) under an "Agreement between San Jose and Santa Clara Respecting Sewage Treatment Plant" dated May 6, 1959. In accordance with this master agreement, the Facility is jointly owned by both cities and is administered and operated by the City of San Jose. Through a series of additional "Master Agreements for Wastewater Treatment," five additional tributary collection systems hold the rights to a share of Facility treatment capacity in addition to the cities of San Jose and Santa Clara: Milpitas, Cupertino Sanitary District, West Valley Sanitation District, County Sanitation District Nos. 2-3, and Burbank Sanitary District. Each agency retains sole ownership and responsibility of its own sanitary sewer collection system.

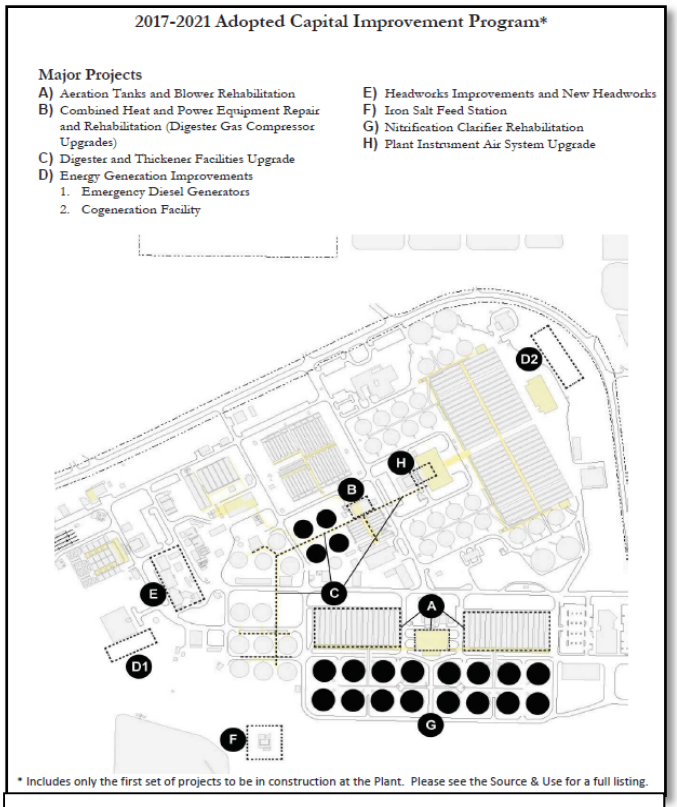
Each agency prepares its revenue program annually. Rates are adopted by ordinance or resolution of the governing body of each Agency. The Agencies' revenue programs are submitted to the City of San Jose, as the administering agency, for review to determine conformity with State Water Board revenue program guidelines.

Reserve Funds. The Wastewater Facility continues to maintain a Reserve for Equipment Replacement of $5.0 million according to its Master Agreement guideline, Clean Water Financing Authority (CWFA) Bond Covenants, and the State Water Resources Control Board's (SWRCB) Fund Loan Agreement policy.

2017-2021 Capital Improvement Program (CIP). The 2017-2021 CIP provides funding of $953.3 million, of which $122.6 million is allocated for 2016-2017. Revenues for the five-year CIP are derived from several sources: transfers from the City of San Jose Sewer Service and Use Charge (SSUC) Fund and Sewage Treatment Plant Connection Fee Fund; contributions from the City of Santa Clara and other tributary agencies; interest earnings; Calpine Metcalf Energy Center Facilities repayments; a federal grant from the US Bureau of Reclamation; and bond proceeds.

- $220 million: transfers from the City of San Jose Sewer Service and Use Charge Fund.
- $288.4 million in contributions from the City of Santa Clara and other agencies.
- $370 million bond issuance.

The CIP is guided by a 30-year Plant Master Plan (PMP) which was approved by City of San Jose and City of Santa Clara City Councils in November and December 2013. The PMP recommended more than 114 capital improvement projects to be implemented over a 30-year period at an investment level of roughly $2 billion.



CIP: First set of projects to be constructed.

Additional information can be found in the Water Pollution Control 2016-2017 Capital Budget at: https://www.sanjoseca.gov/DocumentCenter/View/60646.

Table below provides 2015-2016 actual CIP expenditures & encumbrances as of June 30, 2016.

2015-2016 Capital Improvement Program Year-end Expenditure Summary				
	Appn	Project	Expenditure on 6/30/2016	Current Encumbrances
1	4127	DIGESTER & THICKENER FACILITIES UPGRADE	4,435,871	121,991,638
2	4332	EQUIPMENT REPLACEMENT	305,657	531,375
3	4341	PLANT ELECTRICAL RELIABILITY	13,969	53,122
4	5690	PLANT INFRASTRUCTURE IMPVT	403,912	536,648
5	5957	PUBLIC ART	5,597	108,000
6	6000	CITY-WIDE & PW CAP SUPPRT COST	500,470	0
7	6285	LAGOON & DRYING BED RETIREMENT	104,971	1,009
8	6313	CONSTRUCTION- ENABLING IMPROVEMENTS	530,502	3,140,219
9	6508	SBWR RESERVOIR FACILITY	0	90,135
10	6584	PAYMENT FOR CWFA TRUSTEE	5,000	0
11	6589	REVISED SBAP-SBWR EXTENSION	0	88,839
12	7074	NITRIFICATION CLARIFIER REHAB	163,454	100,129
13	7224	ADVNCD FACILITY CONTRL & METER REPLACEMENT	802,699	303,049
14	7226	E PRIMARY REHAB-SEISMIC & ODOR	50,091	6,283
15	7227	FILTER REHABILITATION	300,310	870,630
16	7230	IRON SALT FEED STATION	379,850	6,529,442
17	7364	SBWR MASTER PLAN	0	5,771
18	7393	T.P. ENGINE REBUILD	72,072	14,365
19	7394	T.P. DISTRIBUTD CONTROL SYSTEM	713,682	250,000
20	7395	URGENT & UNSCHEDULD T.P. REHAB	1,054,980	0
21	7396	YARD PIPING & ROAD IMPROVEMENTS	268,642	27,569
22	7397	T.P. FIRE MAIN REPLACEMENT	4,047	0
23	7448	HEADWORKS IMPROVEMENTS	631,546	539,632
24	7449	NEW HEADWORKS	662,847	961,759
25	7451	NEW FILTER COMPLEX	-1,000	0
26	7452	DIGESTED SLUDGE DEWATERING FACILITY	731,531	113,067
27	7453	COMB HEAT&PWR EQUIP REPR&RHAB	7,879,334	2,880,009
28	7454	ENERGY GENERATION IMPROVEMENTS	14,202,268	8,856,949
29	7456	PRELIMINARY ENGINEERING	809,636	136,682
30	7481	PROGRAM MANAGEMENT	6,746,310	2,477,200
31	7626	SB WATER RECYCL MST PLN REIMB	0	20,000
32	7677	AERATION TANKS & BLOWER REHAB	818,459	487,568
33	7678	OUTFALL BRIDGE & LEVEE IMPROVEMENTS	16,578	88,536
34	7679	FACILITY WIDE WATER SYSTEM IMPROVEMENTS	366,739	203,767
35	7680	PLANT INSTRUMENT AIR SYSTEM UPGRADE	499,662	370,438
36	7681	SUPPORT BUILDING Improvements	678,685	102,320
37	7698	TUNNEL REHABILITATION	0	19,435
		TOTAL	44,158,371	151,905,586

Operating and Maintenance Budget. FY 2016-17 O&M budget increased roughly 4.1% over FY2015/16.

San Jose-Santa Clara Regional Wastewater Facility

FY 2016-17 Operating & Maintenance Budget Summary

Budget Summary	2015-2016 Actual Expenses	2015-2016 Adopted Budget	2016-2017 Base Budget	2016-2017 Proposed Budget
Personal Services	$48,541,494	$52,228,998	$54,264,657	$54,770,465
Non-personal Services	22,843,404	29,912,570	28,933,519	29,379,019
Equipment	1,291,020	1,750,000	900,000	1,060,000
Inventory	355,739	400,000	400,000	400,000
Overhead	7,478,317	7,478,317	8,903,376	8,903,376
NCH Debt Service	1,121,240	1,121,240	1,118,437	1,118,437
Workers' Compensation	115,560	645,000	645,000	645,000
City Services	1,439,220	1,624,488	1,011,422	1,011,422
Total Operating Expenses	**83,185,994**	**95,160,613**	**96,176,411**	**97,287,719**

ESTIMATED COST DISTRIBUTION

2016-17 Estimated Total Gallons Treated (MG)	(1) Percent of Total Sewage Treated	City / District	2016-17 Proposed
25,219.388	64.161	City of San Jose	$62,420,774
4,991.335	14.415	City of Santa Clara	14,024,025
30,210.723	**78.576**	**Sub-Total**	**$76,444,799**
3,552.188	9.271	West Valley Sanitation District	9,019,543
1,928.236	5.179	Cupertino Sanitary District	5,038,531
2,239.690	5.818	City of Milpitas	5,660,199
347.435	0.927	Sanitation District # 2 - 3	901,857
85.897	0.229	Burbank Sanitary District	222,789
8,153.446	**21.424**	**Sub-Total**	**$20,842,920**
38,364.169	**100.000**	**TOTAL**	**$97,287,719**

(1) Composite of four parameters (flow, BOD, SS, ammonia). Source 2015-16 Revenue Program.

Regulatory fees and membership dues.

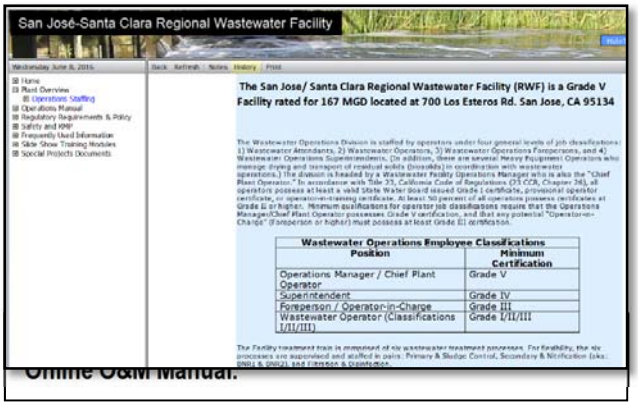
Major Permit Fees		Paid	Paid	Invoiced
Fees	Agency	2014-15	2015-16	2016-17
Permit: Annual NPDES Fee	State Water Resources Control Board	$509,040	$519,351	$525,537
Permit: Annual RMP Participation	Regional Monitoring Program – SFEI	$230,398	$200,583	$234,752
Permit: Alternate Monitoring Fee	Regional Monitoring Program – SFEI			$9,726*
Permit: Annual Air Permit Fee	Bay Area Air Quality Management District	$82,993	$82,417	$80,070
Tax: Annual Cap and Trade	California Air Resources Board Tax	$306,605	$315,460	$303,692
Related Membership Dues				
BACWA Annual Dues	Bay Area Clean Water Agencies	$227,800	$267,636	$292,176
WERF Research Dues	Water Environment Research Foundation	$43,373	$46,184	
CASA Annual Dues	California Association of Sanitation Agencies	$18,720	$18,720	$19,282
Green Cities California Fund	Local Government Sustainable Energy	$5,000	$4,200	

*A new "RMP Alternate Monitoring Fee" was established in 2016 that allows discharging agencies to elect to pay a supplemental fee in lieu of NPDES required quarterly and semiannual monitoring of EPA listed "Priority Pollutants."

b. O&M MANUAL UPDATE

The Facility Online O&M Manual (OLM) is posted electronically on the RWF intranet server. Standard operating procedures (SOPs) are filed in a SharePoint document library to facilitate access and editing. At the end of 2016, 588 SOP documents were filed in the SOP library.

- In 2016, a technical module on training was finalized, PO108-Competency Based Training – Train the Trainer.
- A new instruction was added to the Online O&M Manual "Plant Overview" section to describe facility operations staffing requirements: a) the treatment plant classification (Grade V), b) minimum certification requirements for operators pursuant to 23 CCR, Chapter 26, c) organization chart, and d) typical shift schedule and task assignments.



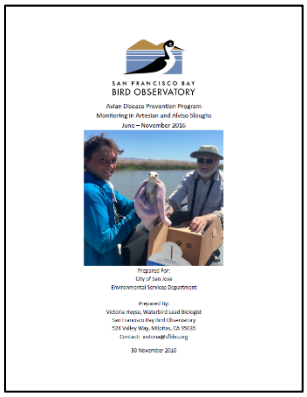
c. CONTINGENCY PLAN UPDATE

Since 1974, the facility has maintained a "Contingency Plan for Continued Operations Under Emergency Conditions." In 2016, the plan was reviewed and updated to reflect personnel organization changes.

3. ENVIRONMENTAL MONITORING

a. Avian Botulism Monitoring

Since 1983, the Facility has contracted with San Francisco Bay Bird Observatory (SFBBO) to monitor for avian botulism outbreaks in the wastewater discharge vicinity from June through November.


SAN FRANCISCO BAY
BIRD OBSERVATORY

Avian Disease Prevention Program
Monitoring in Artesian and Alviso Sloughs
June – November 2016

Prepared For:
City of San Jose
Environmental Services Department

Prepared By:
Victoria Hepa, Waterbird Lead Biologist
San Francisco Bay Bird Observatory
524 Valley Way, Milpitas, CA 95035
Contact: victoria@sfbbo.org

30 November 2016

In 2016, no outbreaks of avian botulism were detected. A total of 17 dead birds were collected and 10 sick birds observed within the survey area of Artesian and Alviso sloughs. No dead or sick birds were identified as having avian botulism. The Avian Botulism Report is posted on the City's web site: http://www.sanjoseca.gov/Archive.aspx?AMID=156&Type=&ADID

b. South Bay Monitoring and Beneficial Uses.

Under the 1972 Clean Water Act (CWA) all dischargers to "Waters of the U.S." are under jurisdiction of U.S. EPA as administrative agent for the federal government. Although there is often dispute over precise limits of "waters of the U.S.," Artesian Slough and Lower Coyote Creek, being "subject to the ebb and flow of tide waters," certainly fall within the definition.

Within California, execution of the CWA is performed by Regional Water Boards, under the authority of California Water Resources Control Board (Water Board). As stated in the San Francisco Bay Basin Plan:

1.4 WATER QUALITY CONTROL PLAN

By law, the Water Board is required to develop, adopt (after public hearing), and implement a Basin Plan for the Region. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the Region. The plan must include:

- A statement of beneficial water uses that the Water Board will protect;
- The water quality objectives needed to protect the designated beneficial water uses; and
- The strategies and time schedules for achieving the water quality objectives.

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basinplan/web/bp_ch1.shtml

NPDES permits are designed to protect "Beneficial Uses" of waters into which the permittee discharges.

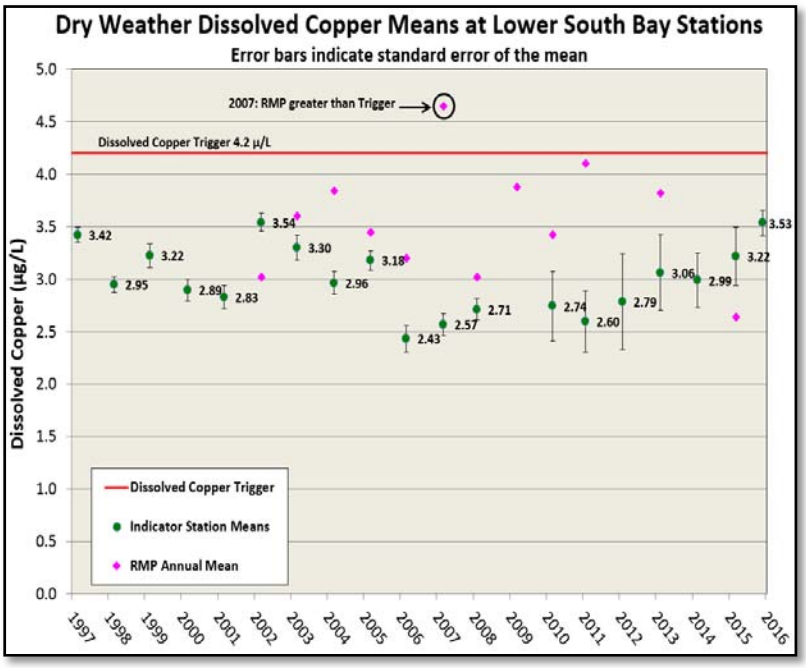
Nine beneficial uses of Artesian Slough

1. Wildlife Habitat (WILD)
2. Fish Spawning (SPWN)
3. Warm Freshwater Habitat (WARM)
4. Cold Freshwater Habitat (COLD)
5. Fish Migration (MIGR)
6. Non-Contact Recreation (REC-1)
7. Contact Recreation (REC-2)
8. Commercial & Sport Fishing (COMM)
9. Rare & Endangered Species (RARE)

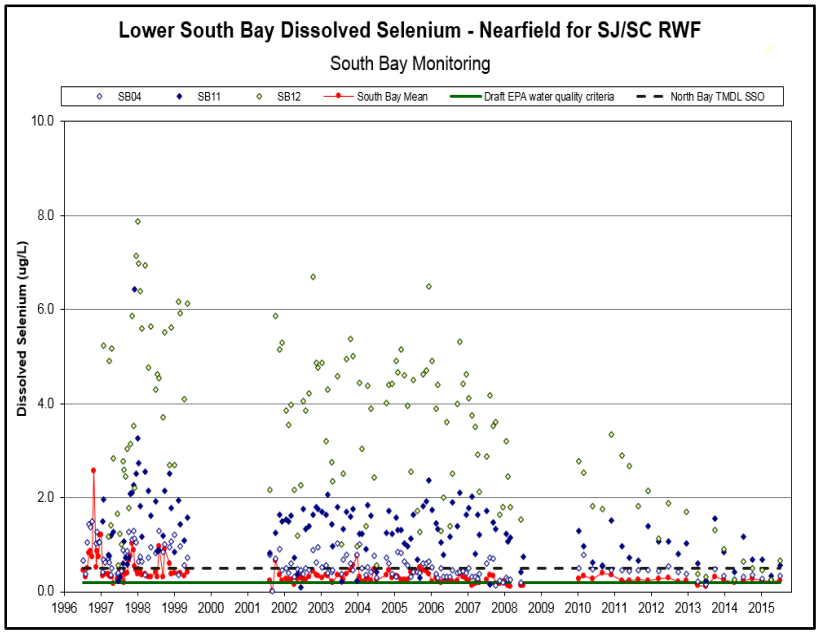
To demonstrate protection of beneficial uses, SJ-SC RWF has conducted water quality sampling at several stations in Lower South San Francisco Bay since 1965. (Several years before the CWA became law!) Originally, only Dissolved Oxygen (DO), pH, temperature, and turbidity were monitored monthly. Ammonia, nitrate, nitrite, and phosphate were added in 1975. Monitoring of certain metals was added in 1997. Currently, two metals, copper and selenium, continue to be monitored quarterly, in addition to DO, pH, temperature, turbidity and nutrients. This additional monitoring of Bay waters is not required under the current Facility NPDES permit.

Metals, nutrients, and water chemistry. Currently, facility staff performs quarterly monitoring of Lower South San Francisco Bay receiving water by boat at 10 stations.

Copper Action Plan. NPDES permits issued to the three Lower South Bay dischargers: SJ-SC RWF, City of Palo Alto, and City of Sunnyvale, include special provisions to "implement additional measures if … the three-year rolling mean copper concentration in South San Francisco Bay exceeds 4.2 ug/l …" The San Francisco Bay Regional Monitoring Program (RMP) collects water samples for metals only every other year. SJ-SC RWF dissolved copper data continues to demonstrate that concentrations are below the 4.2 ug/l threshold. Copper data generated by the SJ-SC RWF is shared and compared against RMP data at least annually.



Selenium. In 2016, EPA released a draft criteria for selenium in San Francisco Bay that included individual criterion for water, fish, and bivalves. Fish are the most sensitive endpoint to selenium toxicity in the Bay. Water and bivalve criteria are derived from fish criteria based on North Bay food web modeling.



Decades of water column, bivalve, and fish tissue data collected in Lower South Bay indicate the proposed water column criterion are overly conservative and would result in unobtainable permit limits for wastewater treatment plants.

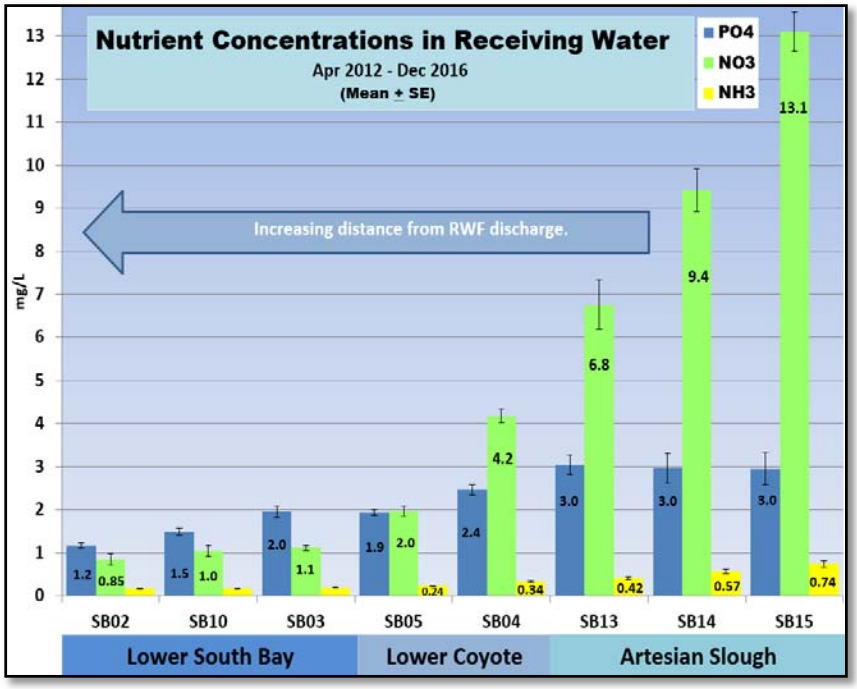
SJ-SC RWF data was used to inform comment letters from both City of San Jose and BACWA. The comments resulted in EPA re-analysis of the draft criteria to consider a more common sense approach to establishing selenium criteria.

Nutrient Monitoring. The SJ-SC RWF is one of very few San Francisco Bay wastewater treatment facilities, and the only large one, that incorporates Biological Nutrient Removal (BNR) into its process. Since incorporating BNR process in 1998, the Facility discharges practically no ammonia, and much lower concentrations of Total Nitrogen (TN) and Total Phosphorus (TP) than Bay Area facilities of comparable, or slightly smaller, size. However, the load of nitrogen is still very high owing to the large amount of treated wastewater discharged.

Thus far, nutrient loads in San Francisco Bay have not been shown to cause detrimental impact to local biota or designated beneficial uses. Nonetheless in the early 2010's, EPA and Regional Water Board became concerned that nutrient loads in other parts of the nation have caused considerable environmental impairment, and that nutrient loads, particularly the nitrogen load, grows with population. San Francisco Bay may not see nitrogen impairment now, but someday, perhaps decades away, additional nitrogen removal may have to be implemented. In light of this concern, SJ-SC RWF started performing additional nutrient analysis of receiving water samples in 2012 in order to establish baseline conditions and better assess future potential impacts on beneficial uses.

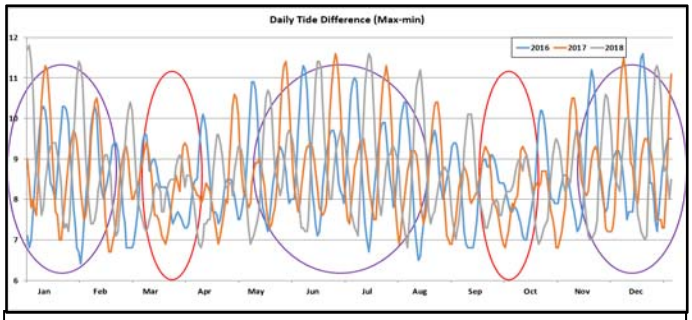
San Francisco Bay Regional Water Board issued a region-wide watershed permit (Order No. R2-2014-0014) to address municipal wastewater discharges of nutrients in 2014. The permit Fact Sheet (attachment F) states:

"Several years may be needed to determine an appropriate level of … management actions necessary to protect San Francisco Bay beneficial uses. This Order is the first phase of what the Regional Water Board expects to be a multipermit effort. It sets forth a regional framework to facilitate collaboration on studies that will inform future management decisions and regulatory strategies. The overall purpose of this phase is to track and evaluate treatment plant performance, fund nutrient monitoring programs, support load response modeling, and conduct treatment plant optimization and upgrade studies for nutrient removal."



The bulk of the SJ-SC RWF biological monitoring in Artesian Slough and Lower Coyote Creek, described in following sections, is aimed at generating data to show correlations between nutrient loads and biological response in local sloughs and salt ponds.

Project Stonehenge. The project was conceived as an inexpensive way to gather data to describe the range of marsh and slough DO throughout the year. A YSI 6600 sonde has been deployed at the Railroad Bridge in Coyote Creek to collect DO, pH, Conductivity, and Temperature data at 15-minute intervals, for two-week periods surrounding the four annual extreme tide and temperature events: winter and summer solstices (greatest range of tides) and spring and fall equinoxes (smallest range of tides). Data collected during these four two-week periods characterize some of the most pronounced seasonal events during the year.

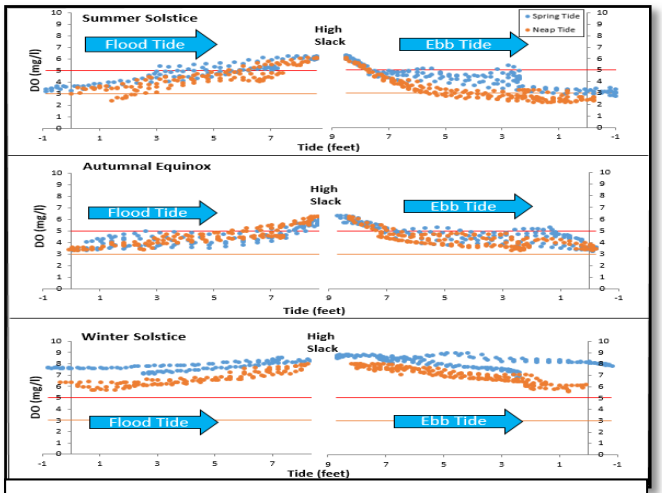


Three years of local tide data showing: a) range of tides during summer & winter solstices (blue circles), and b) during equinoxes (red circles).

Three two-week long events during summer, autumn, and winter 2016/17 have been measured thus far. The data describes the range of DO through tidal cycles.

- DO peaks at high tide and bottoms out at low tide during all seasons.
- Lowest DO during the year occurs during summer at low ebb tide as low DO waters from ponds and sloughs flow back to the Bay. High ecosystem respiration in ponds and sloughs depletes the DO.
- Highest DO occurs during winter, and during ebb tide generally as high DO waters from ponds and sloughs flow to the Bay. Photosynthesis outpaces respiration despite the shorter days.
- DO is generally higher during spring tides when the greater range and velocity of tides help mix water and add DO. However, there was less difference between spring and neap tide DO concentrations in autumn when the range of tides is less extreme.

Environmental Specialist, Ryan Mayfield deploying the sonde.



Stonehenge data showing DO concentrations during flood tides (blue) and ebb tides (orange).

At a future point, this data can be fused with slough and pond hydraulic models to develop more precise estimates of biological activity as affected by nutrients, temperature, freshwater flows and tides.

Phytoplankton Monitoring. A phytoplankton monitoring study continues. Initial samples were collected as quarterly surface grabs in 2013. Samples are collected by RWF staff and sent to BSA Analytical Services for taxonomic identification. Results of three years of surface sampling were summarized in a poster presentation at the 2016 Bay-Delta conference in November 2016.

A poster summarizing three years of phytoplankton monitoring in Lower Coyote Creek was presented at the 2016 Bay-Delta Conference in Sacramento in November 2016.

So far, results have been encouraging:

1. Phytoplankton in Lower Coyote Creek surface samples are very dense. Cell counts and biovolumes are roughly one to two orders of magnitude higher than found further downstream in Lower South Bay. This reflects very high productivity in local sloughs and ponds.

2. Local phytoplankton are dominated by diatoms when measured as biovolumes. Cyanobacteria and chlorophytes dominate cell counts. Diatoms are very large cells compared to other phytoplankton and a high-quality food source for tiny fishes and invertebrates.

3. To date, no Harmful Algal Blooms (HAB) have been observed. Three species known to cause HAB events in other places have been detected at low cell counts, i.e. the cyanobacteria types; Planktothrix, Oscilitoria, and Aphanocapsa. But, no signs of red tides or HAB related toxicity were seen.

BSA Analytical Services enumerates phytoplankton by microscopic analysis. Though tedious, this method has a specific advantage of identifying and quantifying any potential HAB causing species in addition to characterizing all 230 taxa identified thus far. These phytoplankton, when grown correctly, are the crop of tiny one-celled “plants” that results from cycling nutrient fertilizer, carbon, and sunlight into food for bugs and fish.

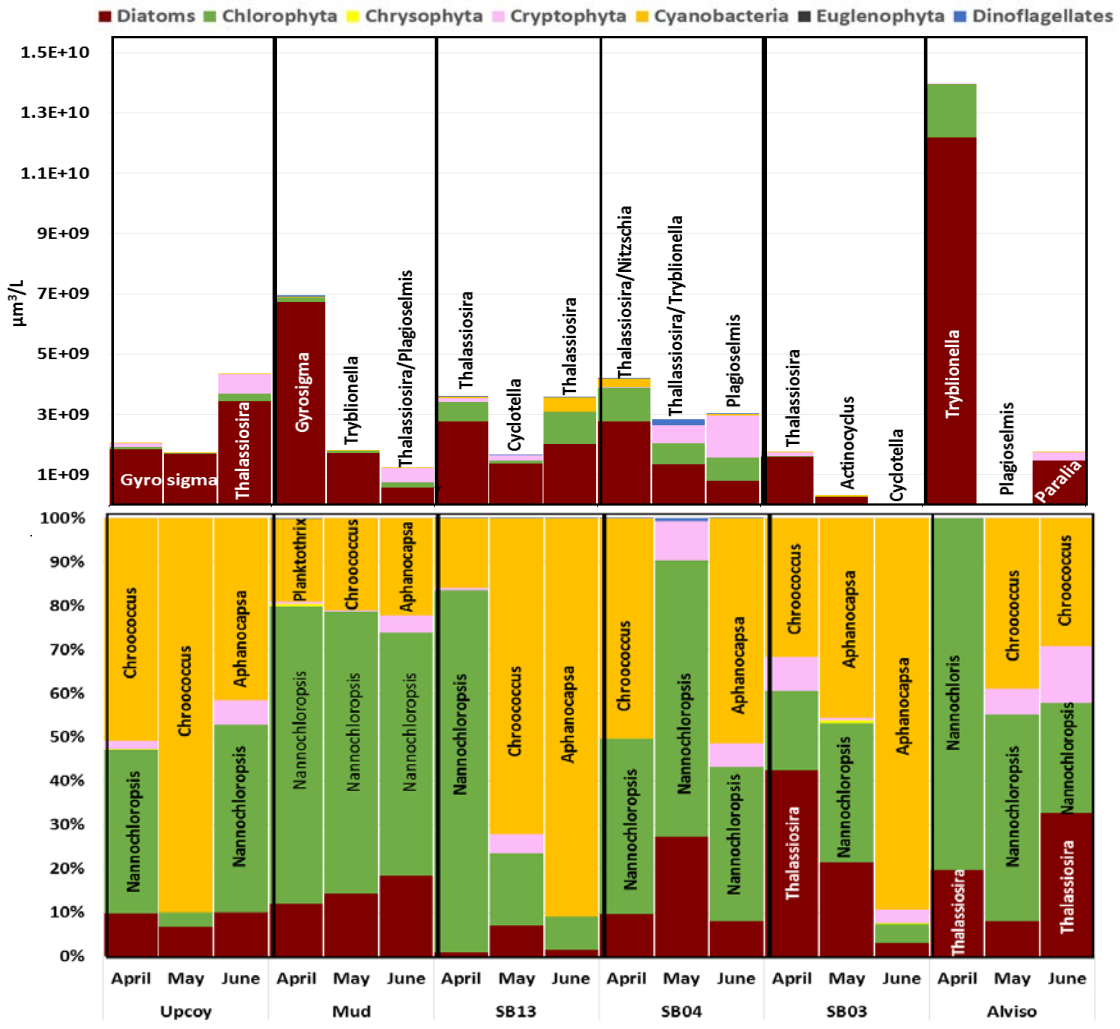
Starting in April 2016, phytoplankton sampling was increased to bi-weekly and samples are now collected at ebb tides at one-meter depth using a Van Dorn sample apparatus. This new sampling method will characterize phytoplankton production flowing out of local sloughs and salt

ponds. The goal is to describe the phytoplankton community in this highly nutrient enriched portion of the Bay.

Sampling on ebb tides, and at depth, reveals a slightly different phytoplankton community over the first three sampling events in 2016:

1. Phytoplankton at depth remain dense, with the sum of biovolumes typically up to one to three billion cubic nanometers per liter (nm^3/l).
2. Diatoms continue to dominate the biovolumes, but chlorophytes, mainly Nanochloropsis and Nanochloris, are more prominent in both cell counts and biovolumes. However, the increase in chlorophytes could also be attributed to wetter weather in 2016.
3. Similarly, a different cyanobacteria, Aphanocapsa, was detected at all stations in June. Aphanocapsa has been indicted as a potential HAB toxin forming species, but no observations of fish, birds, or benthic organisms indicated any toxic biological upset.

In-house monitoring of chlorophyll to correspond with phytoplankton is planned in 2017. Chlorophyll measurements are commonly used to by scientists to characterize phytoplankton biomass and photosynthetic activity.



Phytos in 2016: Three sample events at six stations analyzed using a Van Dorn sampler at one-meter depth during ebb tides.

Benthic Community Monitoring.

In 2016, RWF staff began collecting samples to better assess benthic organisms in Lower Coyote Creek. This work is a continuation of benthic sampling performed in 2014 by the USGS Benthic Lab under contract with the RWF. Under the new arrangement, in-house staff collects and delivers benthic samples to USGS for taxonomic analysis. Having staff collect samples reduces cost and allows for more flexibility in determining sample locations. Benthic samples are collected at the same sampling stations where phytoplankton is collected.

Bivalves found in and near Artesian Slough.

Fish Monitoring.

An 18-month contract with UC Davis to conduct fish trawl surveys downstream of the RWF concluded in December 2016. A final draft report, "Community Structure Change in the Alviso Marsh Complex from 1981-1986 to 2010-2015" documents a comparison of fish population densities from comparable surveys performed in the early 1980s at the same locations. The report concludes that overall fish (38 to 39 species) and invertebrate population densities remained comparable over the three-decade span.

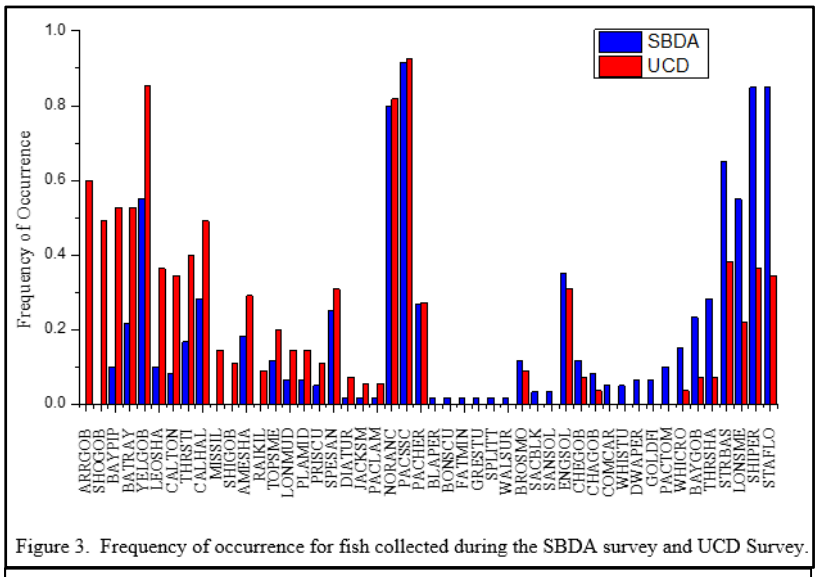
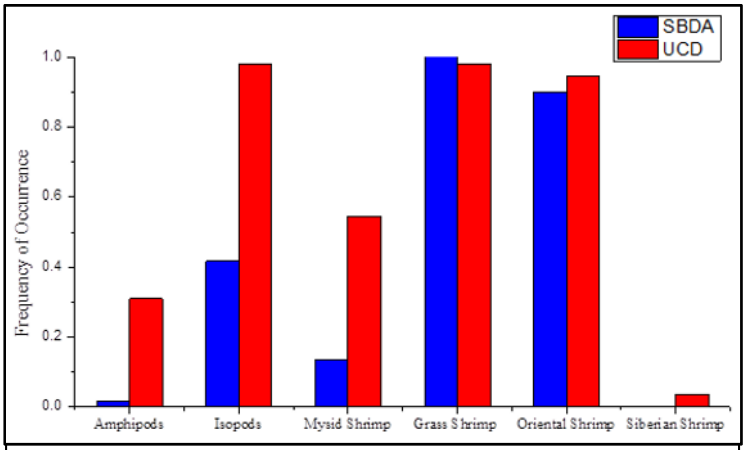


Figure 3. Frequency of occurrence for fish collected during the SBDA survey and UCD Survey.

Then vs. now: Fish trawl survey results in 1980s (SBDA surveys) compared to 2010s (UCD – Dr. Hobbs). Similar with some differences.



More bugs? Shrimp populations may not have changed, but there may be more bottom dwelling amphipods, isopods, & mysids now.

It is notable that fish and invertebrate densities are comparable even as Salt Pond Restoration has opened several thousand additional acres of tidal marsh. In other words, the UC Davis crew is finding similar population densities within a much larger habitat area. More importantly, fish populations are a direct measure of attainment of seven of the nine beneficial uses for which the SJ-SC RWF is permitted to discharge.

A new two-year, $194,000, contract with UC Davis was executed to provide additional fish trawl surveys from January 2017 to December 2018. A total of 8 surveys each year: Artesian Slough/Coyote Creek, 3 stations each, 6 surveys. Ponds A-19 and A-21, 2 surveys.

Jessica Donald & Ryan Mayfield showing samples and equipment.

UC Davis will also perform zooplankton speciation and enumeration for 72 water samples collected by RWF staff during their benthic community sampling events described above. Collections will be performed by using a Clarke-Bumpus net loaned to RWF staff from the UC Davis labs. This is an important component to the biological monitoring effort because the composition and quality of the zooplankton community can have profound effects on local fish populations. The Pelagic Organism Decline experienced in Suisun Bay and the Delta in the mid-1980s is clear evidence of the importance of zooplankton. One of the possible factors leading to the POD was a loss of mysid shrimp and other changes in the zooplankton community in the northern parts of the Bay-Delta System.

Fish as indicators of beneficial use attainment in and near Artesian Slough in 2016.

Summary of Environmental Monitoring costs. The table below summarizes the projected annual costs in 2017 of supplies and analyses for the all the described projects. The costs cited below sum up supply and service order purchases and contract costs to support the projects but to not include roughly $50,000 in RWF staff time consumed in sample collection and handling.

Chemical & Biological Monitoring in Artesian Slough & Bay

	Monitoring Project	Analytical Lab	Freq.	Cost of supplies & analytical work
1	South Bay Monitoring at 7 stations: (Cu, Ni, Se, NH3, NO2, NO3, TKN, PO4, pH, Cond, DO)	In-house	Quarterly	31,600
2	Nutrient Monitoring at 6 stations	In house	Monthly	8,550
3	Stonehenge DO monitoring at 1 station	In-house	Quarterly	1,700
4	Phytoplankton sampling at 6 stations	BSA	2X/month	31,000
5	Chlorophyll monitoring at 6 stations	In-house	2X/month	12,700
6	Benthic monitoring at 6 stations	USGS	6X/year	10,000
7	Fish Assemblage monitoring	UC Davis	2X/quarter	89,000
8	Zooplankton sampling at 6 stations	UC Davis	Monthly	7,400
				191,950

c. Other activities.

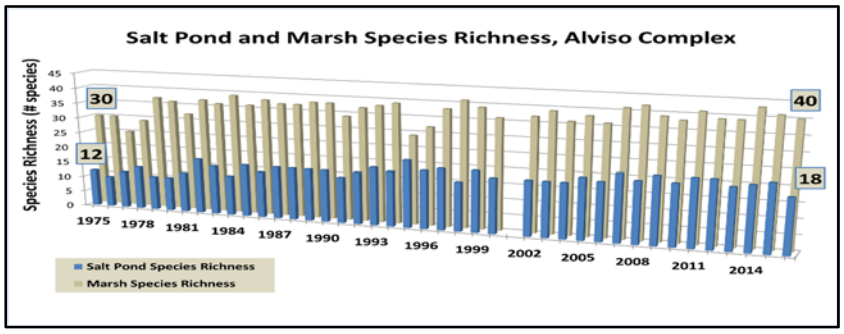
Coyote Creek Streamgage:

Since 1998, the City has co-funded with the Santa Clara Valley Water District a permanent stream gaging station on Coyote Creek, operated by the United States Geological Survey. This gage provides data on year-round surface flows from the Coyote Creek watershed into the South Bay to better understand any pollutant loadings. The annual cost to the City is $12,275.

USGS Santa Cruz field office chief Anthony Guerriero demonstrates Coyote Creek stream gage electronic sensors to RWF staff in 2016.

Audubon Society Christmas Bird Counts. Staff continues to collaborate with the local Audubon Society for bird conservation projects and studies. Their Christmas Bird Counts provide an annual tally of migratory birds in and adjacent to Facility property, including Pond A18. The 2016 census underscores the habitat value of Facility wetlands, with overall counts roughly double the population tallies recorded before six nearby salt ponds were breached and managed for long-term restoration in 2005-2006.

Avian abundance and species richness datasets continue to indicate a stable and diverse waterfowl assemblage. Such positive trending of both salt pond and marsh species illustrates Facility property provides attractive foraging and congregating habitat for a multitude of bird species.



UCLA Geological Coring.

Facility staff were contacted by Dr. Glen MacDonald, Chair of the UCLA Geography Department early in 2016. Dr. MacDonald and his department sought access to undisturbed "virgin" marsh to examine soil and marsh history in Bay's southern-most marshes.

The UCLA team visited the Regional Wastewater Facility in June. RWF staff transported the researchers and equipment to Triangle Marsh, the last large plot of undisturbed marsh, which is located in Lower Coyote Creek just downstream from Artesian Slough.

The article below was posted in the July 2016 issue of the Environmental Services Department newsletter, "Green Matters."

Going Hard-Core In the Marsh

By Ryan Mayfield

In June, I accompanied Dr. Glen MacDonald, chair of UCLA's Geography Department, and members of his lab to Triangle Marsh to take sediment core samples. Located near the RFW's treated effluent discharge site south of Dumbarton Bridge, Triangle Marsh is the only large patch of marsh in the area that has never been touched by development—which is why MacDonald wanted to study it.

"It's rare that we can take a core sample so deep. Normally we're lucky if we get up to 10 or 12 feet deep."
~ Dr. Glen MacDonald, chair of UCLA's Geography Department

MacDonald and his team visit marshes from San Francisco Bay to Southern California to learn more about California's geologic history. They specialize in taking sediment core samples to determine marsh age. Learning about ancient marsh conditions provides insight into future marsh restoration and preservation work. Coring an untouched marsh can determine climate conditions thousands of years ago.

After boating out to the marsh and setting up coring equipment, the probing began. The first few cores went down 19.5 feet! "It's rare that we can take a core sample so deep," said MacDonald. "Normally, we're lucky if we get up to 10 or 12 feet deep," he explained.

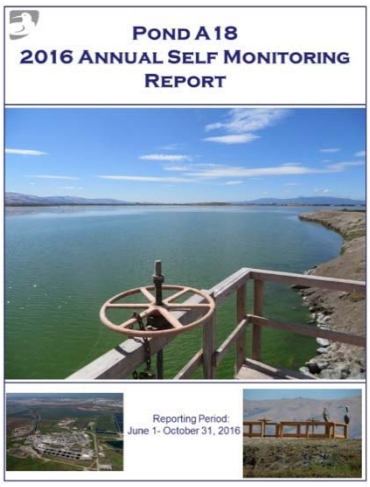
After pulling samples from the ground, the team cut them into sections and wrapped them in aluminum foil. The samples will be analyzed back at the UCLA labs for carbon and other isotopes. This data will reveal how the marsh grew and cycled carbon many thousands of years ago.

In contrast to Triangle Marsh, most of the surrounding South Bay marshes were developed long ago for use as salt ponds. Purchased by government resource agencies in the mid-2000s, these ponds are now being restored to tidal marsh habitat. It's nice to learn that we have a unique and important piece of the original marsh right on our doorstep.

ESD and UCLA staff taking a core sample (left to right): Scott Lydon, Ryan Mayfield, and Glen MacDonald.

UCLA's Lauren Nicole and Glen MacDonald looking at a core sample.

d. Pond A18 Monitoring



Pond A18 circulates San Francisco Bay (Bay) water using two hydraulic control structures located at the northern and southern ends of the western levee bounding the 856-acre pond. Discharge of pond water to Bay receiving water is regulated by Waste Discharge Requirements (WDR) Order No. R2-2005-0003. Since the pond is a shallow, slow circulating system, it is prone to high algal biomass and phytoplankton community succession, and the associated high respiration/decomposition rates cause the pond to become susceptible to low dissolved oxygen conditions, known as hypoxia.

The WDR requires continuous monitoring for DO, pH, temperature, and salinity within the pond, as well as monthly monitoring at four stations in the receiving water during the dry season (June through October). Additional monitoring at three of the receiving water stations in Artesian Slough/Coyote Creek is conducted whenever the pond's dissolved oxygen concentration falls below thresholds specified in the WDR. Twelve years of water quality monitoring have demonstrated that pond discharge has no negative impacts to receiving water even during periods of pond hypoxia.

The City also maintains the pond's levees and hydraulic control structures. In 2015 the Pond's aging and failing northern structure was replaced to avoid possible breach of the levee. Following reconstruction of the northern structure, a more thorough evaluation of the southern structure revealed that the wooden barrier that prevented debris and large fish from entering the pond had been undercut. In response, City staff fabricated and installed fish barriers on the end of the water control structure pipes in place of the flap gates. These new covers have been effective in keeping large fish from entering the pond.

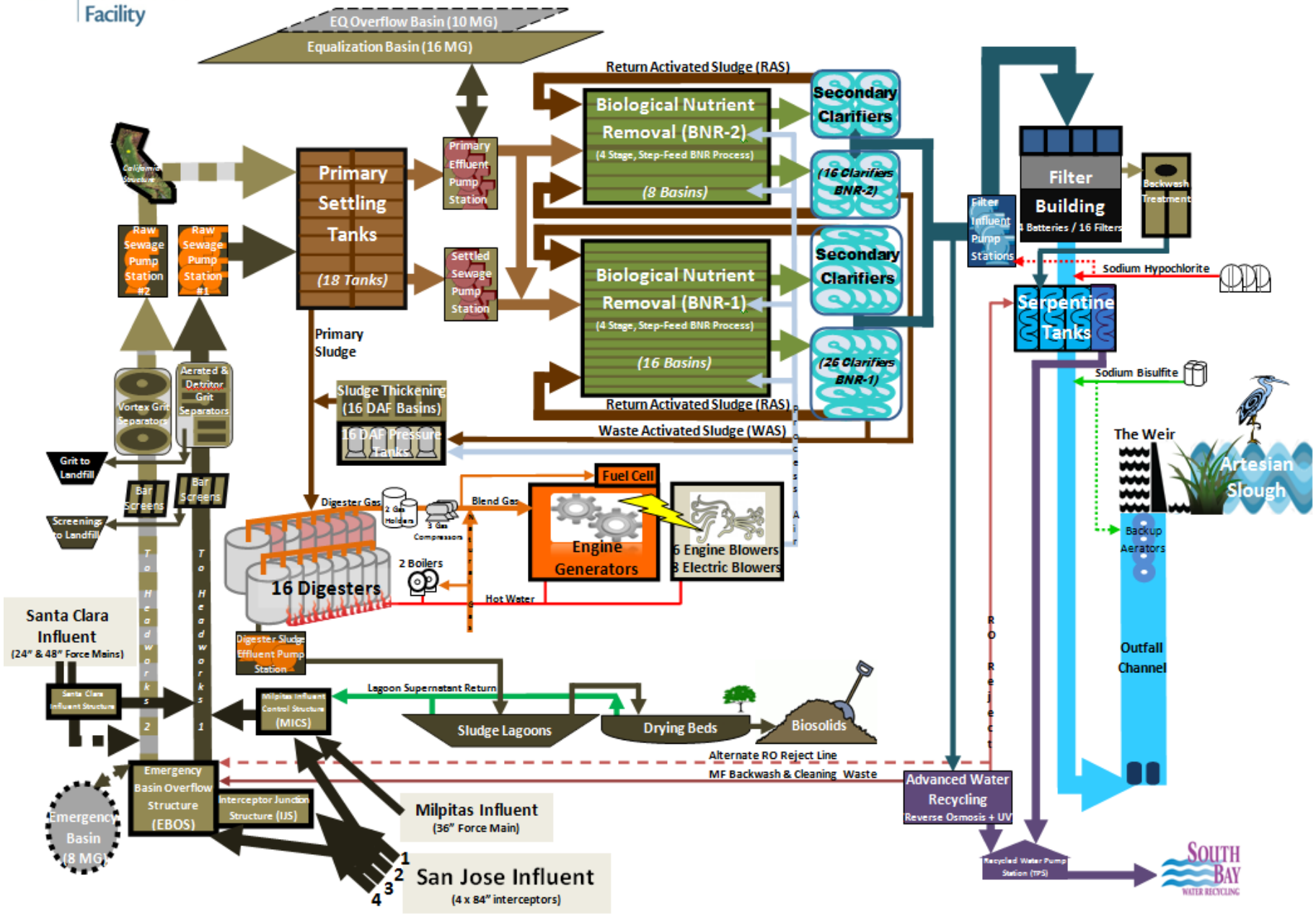
The City and contracted engineers from HydroScience Engineers, Inc. continue to monitor the mechanical and geotechnical vulnerabilities of the pond levees and structures. These ongoing evaluations will identify the necessary repairs to the southern structure and determine appropriate adjustments to pond operations to ensure the southern structure and adjacent levee are not exposed to unnecessary scour or erosion.

The full Pond A18 Annual Report is posted on the City of San Jose web site at: http://www.sjenvironment.org/Archive.aspx?AMID=155&Type=&ADID=

San José-Santa Clara Regional Wastewater Facility

Process Schematic

Revised: 2/2014



ATTACHMENT A - Laboratory Accreditation

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

San Jose / Santa Clara WPCP Laboratory

ESD

4245 Zanker Road

San Jose, CA 95134

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1313**

Expiration Date: **9/30/2018**

Effective Date: **10/1/2016**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program